

Integrated Algebra/Geometry II

Miss Behl - Room 231

Course Information:

This course continues the integrated math sequence and builds on the students' previous exposure to mathematics. Attention is given to the core topics of algebra, geometry, trigonometry, logic, statistics/probability, discrete math, and modeling. The course continues the development of real number skills and applications and explores linear and quadratic functions. New data modeling techniques are introduced, along with properties of quadrilaterals and right triangle trigonometry. This course also focuses on graphing systems of linear inequalities and solving systems of linear equations. Technology is used to enrich problem-solving skills and to develop techniques through use of the TI graphing calculator. **The purchase of a TI-83 or TI-83 Plus is required!!**

Course Objectives:

- Understand key concepts of introductory algebra, geometry, trigonometry, and statistics/probability.
- Understanding algebraic manipulation in the real world and purely mathematical settings.
- Apply knowledge of graphing techniques to explore quadratic equations and curve fitting.
- Apply knowledge of volume and area to determine optimal polygon for bees to build their honeycombs.
- Apply knowledge of solving linear systems to determine the maximum profit in a business setting.
- Present multiple solutions strategies and explain the rational for choosing various solutions strategies through writings in portfolios, Prompts of the Week, and oral class participation
- Utilize effective interpersonal skills by working in cooperative groups.

Classroom Rules

1. Treat others as you want to be treated.
2. Follow all directions the FIRST TIME they are given.
3. Be in your seat and ready to begin class when the bell rings.
4. Bring all materials to class everyday; notebook, paper, textbook, graphing calculator, assignment book, and pencils or pen (blue or black ink only).
5. Only 1 person speaks at a time.
6. Raised your hand and wait to be called on in order to address the class or teacher.
7. Stay in your seat until you are dismissed.

Materials:

- Notebook: 3-ring binder (preferably 2 – 2.5 inches)
- Loose Leaf (lots of it)
- TI-83 or TI-83 Plus graphing calculator
- Assignment book
- Textbook
- Pencil/Pen (blue or black ink ONLY)
- Colored Pencils or Markers

Business and Breaks:

Near the beginning of class, there will be five minutes dedicated to addressing business that is not directly related to the lesson. For instance, role will be taken, comprehension meters distributed, late and absent work handed in, etc.

Near the middle of class, there will be five minutes dedicated to break time, this is when you can sharpen your pencils, stretch, rest, get a drink of water, go to the restroom or nurse, etc. Please remember that this break is a privilege, not a right. If this break is abused in any way, you or your class could lose this privilege.

Absences:

If you have **ONE EXCUSED ABSENCE**, and an assignment was **given** the day you were out, you have **2 days to make up the work**. This means that you need to get in touch with me, or a classmate to get the missed assignments. If you do not have the assignment upon return, it will be considered late.

If you are absent or late to school when an assignment is **due**, the assignment is due **when you return to the building**. You may come before school, after school, or during advisory and place the assignment in the bin marked "ABSENT" or, you may give it to the secretary at the front office and they will place it in my mailbox.

If you are absent on the **day of an exam**, it is **your responsibility to see me and schedule a time to make it up outside of class**. If an exam is **not made up within an appropriate amount of time, which is decided between the student and teacher, the student will receive a 0% for that grade**.

If you are absent for two or more consecutive days you have the numbers of days you were absent plus one day to make up your work. For instance, if you were absent for two days, you have three days to make up your work. It is extremely important if you are absent for two or more days to talk to me to avoid falling behind.

Lateness:

1) Late to class

You are expected to be in class when the bell rings. If you have a note, please deposit the note in the designated box by the door, sign in and take your seat without disturbing the class. If you do not have a note, please sign in and take your seat without disturbing the class. If you have three unexcused lateness within one marking period you will receive a detention.

2) Late assignments

Although I do not anticipate frequent late assignments from any student, if you do not have your work on the assigned due date, you may still turn it in for partial credit. HOWEVER, you must attach a late slip to the assignment completely filled out and place it in the bin marked "LATE". Please handle this in the first five minutes of class (business time), not during instructional time. Late assignments will not merit full credit. The amount of points deducted depends on the type of assignment.

Grades:

- Test and Quizzes
- Homework & Class work (daily assignments)
- Group work
- Prompts of the Week (long term assignments)
- Notebook checks
- Portfolios (long term assignment, approximately one per marking period)
- Presentations (in class)
- Class secretary

--**Grading policy:** Grades are based on a point system. Averages are calculated by dividing the total points earned by the student by the total number of possible points. Letter grades will be assigned in accordance with school guidelines.

A = 93 – 100 B = 85 – 92 C = 77 – 84 D = 70 – 76 F = 0 – 69

Notebooks:

The notebook is an essential part of the course. Taking notes in class is very important because the textbook does not contain the process to solve the problems. In class, you will discuss and develop the process. Your notebook becomes your resource when solving problems. A good notebook should have each type of problem solved along with explanations (steps taken to solve the problem). Each entry in the notebook should have the proper MLA heading in the upper left corner of your paper. Notebooks will be collected and checked throughout the marking periods.

<u>MLA Heading</u>
Your Name
Class (i.e. IAG 2 - 2)
Teacher's name
Date of assignment

Class Secretary:

Every two weeks, a student will be given the job of class secretary. You can earn up to 10 extra credit points for completing your responsibilities. As class secretary, you will write down the agenda for the class each day, the homework, and the people who are absent that day (if any) from class. If there are important notes taken in class the secretary will make sure his/her notes are accurate and complete so that they can be included in the "secretary's log". This log will allow students in the class to reference important class information at any time. Additionally, each class will have a box with hanging folders (color coordinated for A and B days) and there will be one folder for each day of the week. The class secretary is also responsible for collecting extra copies of all the handouts for the day and places them inside the appropriate folder. Lastly, the class secretary will begin each class with a recap of the previous days work.

Availability:

If at any time you are having trouble completing a problem or understanding a concept, please let me know right away. Do not wait until the day or two before a test or quiz to get help. I will be glad to meet with you outside of class to help in any way I am able. I am usually at school each day between 7:00am - 3:30pm. You can find me in rooms 229, 231, or in the second floor teachers' work room (221). I can also be reach through email, Behl@haysd.net and phone 610-853-5900 ext. 2720.

I have read and understand the class expectations and policies for Miss Behl's class. If I have any questions or concerns, I know how to contact Miss Behl.

Print Student's Name: Michael Plasmeier

Student's Signature: Michael Plasmeier

Date: 9/11/05 plasmeier180@msgh.com

Parent/Guardian's Signature: A. Lf

Parent/Guardian's e-mail address: anneimhof@gmail.com

Date: 9/10/05

Official Order

Solve - It Notebook Index

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Pattern Revision

9/9

Oct		I	
25	-2	2	-1
26	-1	6	-1
27	4	2	4
28	2	2	2
29	-2	2	-2
30	-12	5	-12
(2)		(2)	

Copy wrong

$$\frac{2}{-4} = -2x + 4$$

$$y = -2(-5) + 4$$

$$y = -6$$

$$-12 = 2(x) + 4$$

$$-16 = 2x$$

$$-8 = x$$

$$= 2x/2 =$$

11/4 = 2.75 < Expected Value per turn

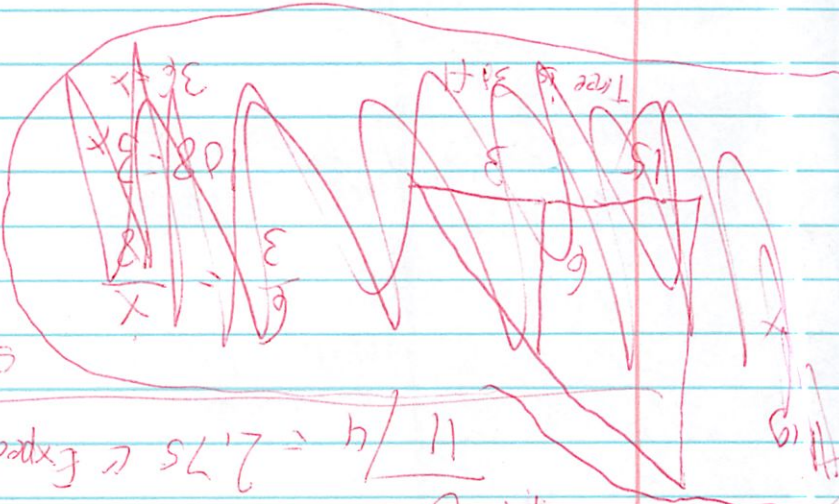
$$H/T = 3$$

$$T/H = 3$$

$$H/H = 5$$

$$T/T = 0$$

2 coins
PT 6



$$8x = 6 \times 15$$

$$8x = 96$$

$$x = 36$$

$$\frac{6}{3} = \frac{x}{15}$$

Overland

$$(71 - 3k) / 5 = A$$

7 kids

k kids

$$(71 - 3(7)) / 5$$

A adults

$$(71 - 21) / 5$$

$$50 / 5 = 25 \text{ Adults}$$

Michael Plasterer
IAG 2+1
Behl
9/9/05

Year 1 Review

①

9/9

$$1. \quad \begin{array}{r} 4a = 12 \\ 4 \quad 4 \\ \hline a = 3 \end{array}$$

$$2. \quad \begin{array}{r} r + 5 = 20 \\ -5 \quad -5 \\ \hline r = 15 \end{array}$$

$$3. \quad \begin{array}{r} 2m + 1 = 11 \\ -1 \quad -1 \\ \hline 2m = 10 \\ \hline 2 \quad 2 \\ \hline m = 5 \end{array}$$

$$4. \quad \begin{array}{r} \frac{x}{3} = 8 \\ \times 3 \quad \times 3 \\ \hline x = 24 \end{array}$$

Cross X

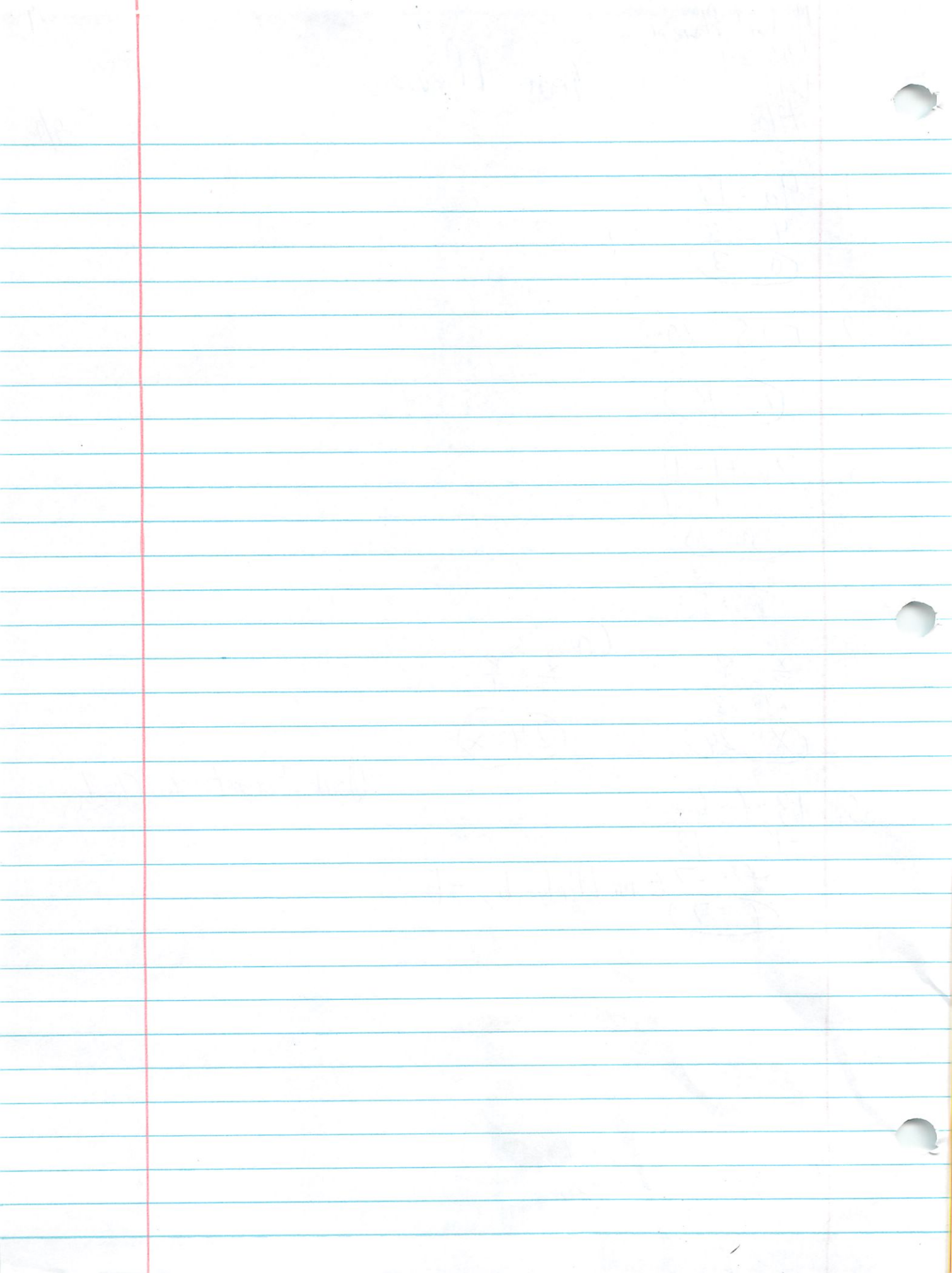
$$\frac{x}{3} = \frac{8}{1}$$
$$24 = x$$

Don't Forget to Check

$$5. \quad \begin{array}{r} 13 - f = 6 \\ -13 \quad -13 \\ \hline f = -7 \end{array}$$

multiply by -1

$$f = 7$$



Running the Trail (#4)

(2)

9/13

1. P = Money that Phillippe has

$$\begin{array}{r} P + 7 = 30 \\ -7 \quad -7 \end{array}$$

$$P = 23 \quad \text{Phillippe has \$23,}$$

2. L = Distance around the lake

$$\begin{array}{r} 2 + 2L + 2 = 10 \\ -2 \quad -2 \quad -4 \end{array}$$

$$\frac{2L}{2} = \frac{6}{2}$$

$$L = 3$$

It is 3 miles around the lake

3. X = Num of people in wagon originally
 T = Total Gal of water

$$5X = T$$

$$4(X+2) = T$$

or

$$5X = 4(X+2)$$

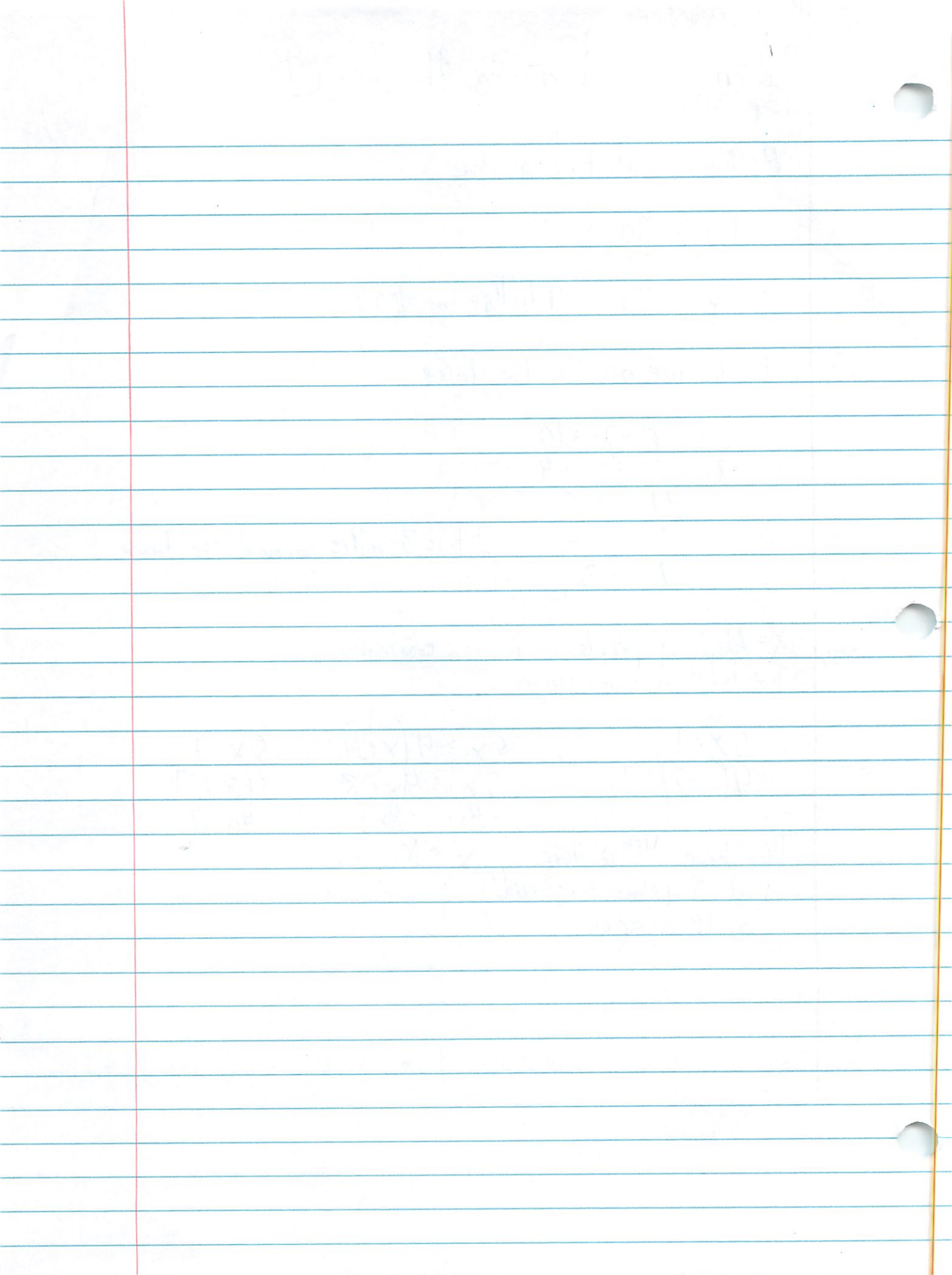
$$\begin{array}{r} 5X = 4X + 8 \\ -4X \quad -4X \end{array}$$

$$5X = T$$

$$5(8) = T$$

$$40 = T$$

They have 40 gallons
and 8 people originally
in the wagon $x = 8$



Name: Michael Plasner
 IAG 2
 Solve It

Date: 9/13

Linear Modeling

Directions: For each of the problems below, choose a variable for the problem, identify what the variable represents, write an equation to 'model' the problem, and solve the problem.

1. Henrietta is an extremely competitive girl scout come cookie season. She has sold four times as many cookies as her entire troop. Today, she sold another 10 boxes, bringing her total to 234 boxes. How many boxes of cookies has her troop sold? (T)

$$4T + 10 = 234$$

$$\frac{4T}{4} = \frac{224}{4}$$

$$T = 56$$

Check

$$4(56) + 10 = ?$$

$$224 + 10 = ?$$

$$234 = \checkmark$$

$$4(290) + 10 = 234$$

If you need to find this that is what you are finding it would be recurring and impossible

BA it is recurring

Answer: 56 Boxes

2. Fast Eddie and Frisky Frankie are going to start a personal trainer company. Fast Eddie feels that it would be best to charge customers \$20 per hour. Frisky Frankie feels that they should charge a flat fee of \$50, and then \$15 per hour of training. Suppose you were a customer for Eddie and Frankie, and you planned on at least 10 hours of training. Which plan would you choose and why?

$$E = 20H$$

$$F = 15H + 50$$

At 10 hours, the both charge \$200
 $20(10) = 15(10) + 50$ At 9 hours Eddie

charges less (180 vs 185) At 11 hrs
 Freddie costs less, If they do at least
 10 hrs Frankie will cost less

$$20(10) = 200$$

$$15(10) + 50 = 150 + 50 = 200$$

Answer: Frankie

$$20(9) = 180$$

$$15(9) + 50 = 135 + 50 = 185$$

$$20(11) = 220$$

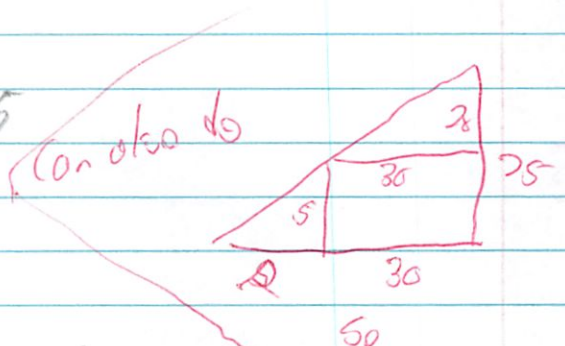
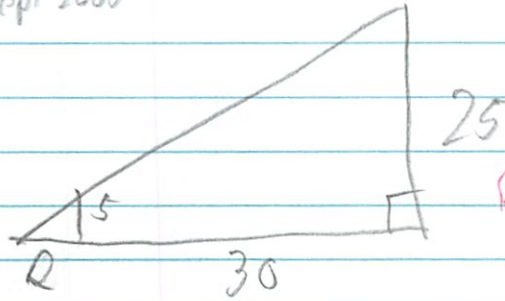
$$15(11) + 50 = 165 + 50 = 215$$

Michael Plasmia
Behl
TAG 2H
13 Sept 2005

Lamppost Shadows

9/13

1.



$$\frac{5}{x} = \frac{25}{30+x}$$

$$25x = 5(30+x)$$

$$25x = 150 + 5x$$

$$-5x \quad -5x$$

$$20x = 150$$

$$x = 7.5$$

$$\frac{5}{x} \text{ similar } \frac{20}{30}$$

a 6 feet

b $\frac{5}{x+30} = \frac{5}{25}$ is small long = small high
Big long large high

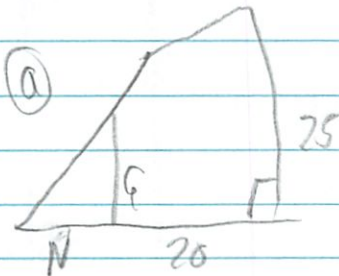
c $5(30+x) = 25x$
 $30x + 2x = 25x$

how to solve

(hantello's shadow is 7.5 ft long, I did equation above)

d Of course but I forgot it was 25 vs 30+5, I forgot the 5

2.



$$\frac{6}{N} = \frac{25}{20+N}$$

$$6(20+N) = 25N$$

$$120 + 6N = 25N$$

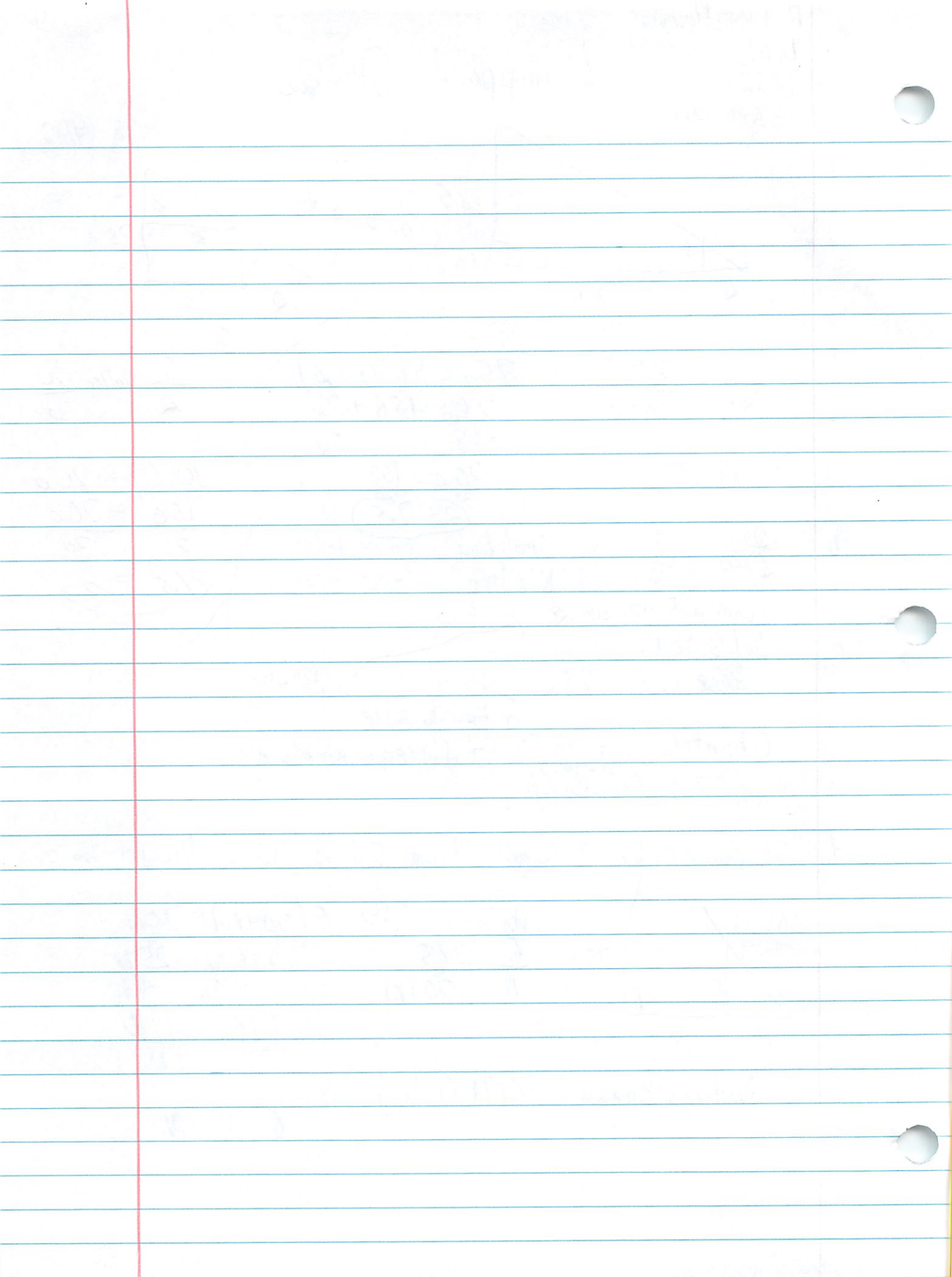
$$-6N \quad -6N$$

$$120 = 19N$$

$$\frac{120}{19} = \frac{19N}{19}$$

Nelson's shadow is 6.31 ft long.

$$6.31 = N$$



Michael Plasmair
Bohl
IAGTH
13 Sept 2005

Catching Up

p 26

4/13

1. Sewyer Farm - 120 miles / 3 hrs^{mph} = 40 hrs need to travel

$$40/10 = 4 \text{ days}$$

$$\text{Train } 40/8 = 5 \text{ days}$$

to travel 120 miles

6 days

$$\text{Sewer } 10 \text{ hrs} \times 3 \text{ miles} = 30 \text{ miles per day}$$

$$y = 30x$$

x = Day

$$\text{Train } 8 \times 3 = 24 \text{ miles " "}$$

$$y = 24x$$

a Sewer $y = 30(6) = 180$ to be at 60 miles

b Train $y = 24(6) = 144$ at 144 miles

c No they are 36 miles behind

2 a Sewer $y = 30(15) = 450$ at 330 miles

b Train $y = 24(15) = 360$ at 360 miles

c No they are 30 miles behind

3 a Sewer
 $y = 30N$

b Wagon $x = 24N + 120$

forget to add that

c They would meet at Day 20

$$y = 30N = 24N + 120$$

$$30(20) = 24(20) + 120$$

$$600 = 480 + 120$$

$$600 = 600$$

Page 1

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2. Methodology

3. Results

4. Discussion

5. Conclusion

6. References

7. Appendix

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9. Contact Information

10. Summary

11. Glossary

12. Index

13. Bibliography

14. Appendix

Michael Plummer
Bohl
IAG 2H
15 Sep 2005

Mystery Bag #6

9/15

x =
Bag
of gold
in b2

$$1. \frac{3x}{3} = \frac{51}{3}$$

$$x = 17$$

Remember
the Problem

$$2. 1x + 42 = 100$$

$$-42 \quad -42$$

$$x = 58$$

$$3. 8x + 10 = 90$$

$$-10 \quad -10$$

$$\frac{8x}{8} = \frac{80}{8}$$

$$x = 10$$

$$4. 3x + 29 = 4x$$

$$-3x \quad -3x$$

$$29 = x$$

$$5. 11x + 65 = 4x + 100$$

$$-65 \quad -65$$

$$11x = 4x + 35$$

$$-4x \quad -4x$$

$$7x = 35$$

$$\frac{7x}{7} = \frac{35}{7}$$

$$x = 5$$

$$x = 10$$

$$6. 6x + 13 = 6x + 14$$

$$-14 \quad -14$$

① $6x - 1 = 6x$

$$\frac{6x - 1}{6} = \frac{6x}{6}$$

$$x - \frac{1}{6} = x$$

Doesn't work

(one bag has 1oz of gold stolen from it)

$$7. 15x + 7 = 15x + 7$$

$$-15x \quad -15x$$

$$7 = 7$$

Work not correct

could be any poss

See

$$105 + 7 = 105 + 7$$

$$112 = 112$$

8. Solve the equation by let it weights on both sides, remove from both sides the same amount so 1 side doesn't have any weights then do the same for the gold so there are bags on 1 side and weights on the other. Then divide both sides by the # of bags. You now should have 1 bag and its weight on the other.

#6

$$6x + 13 = 6x + 14$$

$$-6x \quad -6x$$

$$13 = 14$$

$$-1 \quad -1$$

$$12 = 13$$

$$\frac{12}{2} = \frac{13}{2}$$

$$x = 13.5$$

try it!

$$6(13.5) + 13 = 6(13.5) + 14$$

$$81 + 13 = 81 + 14$$

$$94 = 95$$

(X)

13

91

(X)

$$15b + 7 = 15b + 7$$

$$-15b \quad -15b$$

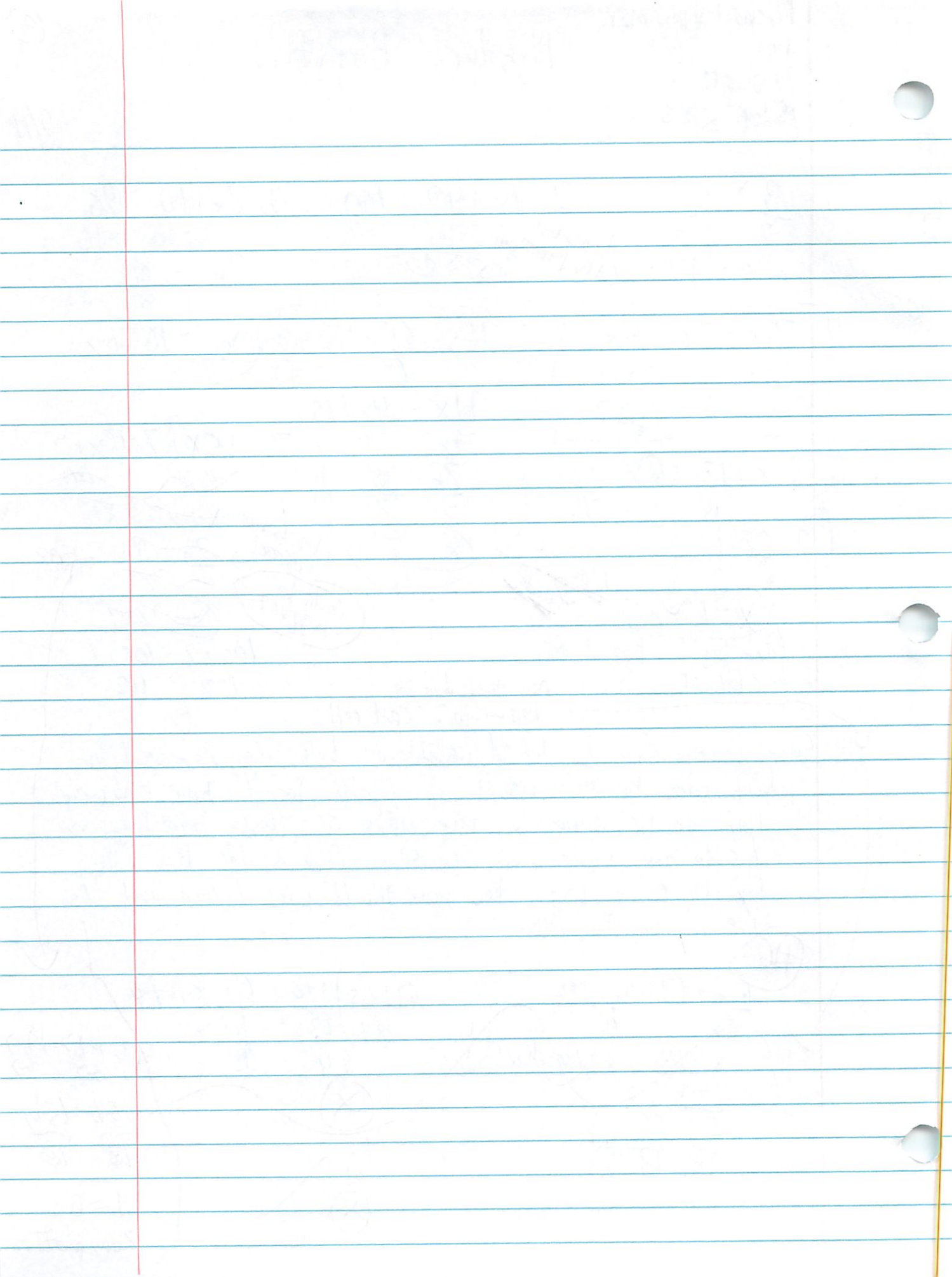
$$7 = 7$$

$$15b = 15b$$

$$\frac{15b}{15} = \frac{15b}{15}$$

$$b = b$$

any poss



Michael Plasmior
Bohl
TAG 2 H
15 Sept 2005

Solving Equation Notes

⑦

9/25

Main goal - solve for the variable by following the rules/guidelines

- want to get x (or any variable) by itself ($1x$)

- So want to collect like terms so that all the variables are on 1 side and # on the other

- what ever you do to 1 side, you must do to the other side

Verb: variable - a letter that represents the unknown #

Coefficient - the number in front (and is being multiplied by the variable)

Ex 1. $5x = 150$

$$\frac{5x}{5} = \frac{150}{5}$$

$$(x = 30)$$

2. $3x + 2 = 11$

$$\frac{3x + 2}{-2} = \frac{11}{-2}$$

$$\frac{3x}{3} = \frac{9}{3}$$

$$(x = 3)$$

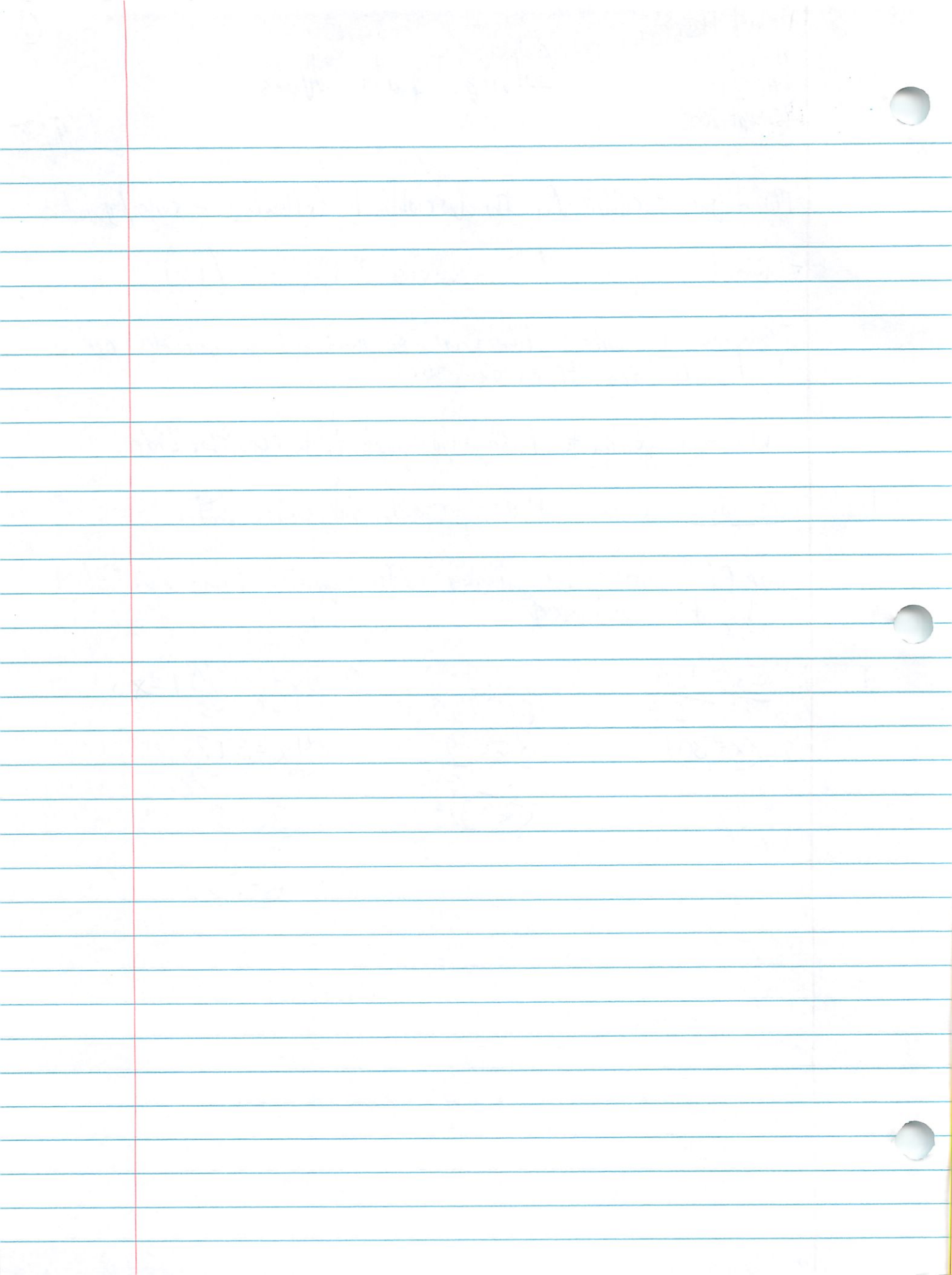
3. $4x + 5 = 10 + 2x$

$$\frac{4x + 5}{-5} = \frac{10 + 2x}{-5}$$

$$\frac{4x}{-2} = \frac{5 + 2x}{-2}$$

$$\frac{2x}{2} = \frac{-5}{2}$$

$$(x = -2.5)$$



Michael Placere
Behl
IPK 2H
15 Sept 2005

You are the Jester ⑦

9/15

1a. $x + 16 = 43$
 $\begin{array}{r} x + 16 = 43 \\ -16 \quad -16 \\ \hline \end{array}$

$x = 27$ 02
Units

b. $12x = 60$
 $\begin{array}{r} 12x = 60 \\ \underline{12} \quad \underline{12} \end{array}$

$x = 5$ 02

c. $27 + 9x = 90$
 $\begin{array}{r} 27 + 9x = 90 \\ -27 \quad -27 \end{array}$

$9x = 63$
 $x = 7$ 07

2a. Put 5 bags + 24 oz of weight on
1 side and 2 bags + 31 oz of weight
on the other

$$\begin{array}{r} 5M + 24 = 2M + 51 \\ -24 \quad -24 \\ \hline \end{array}$$

$$3M = 27$$

$$\begin{array}{r} 3M = 27 \\ \underline{3} \quad \underline{3} \\ \hline \end{array}$$

$M = 9$ 02

7 Mon 4 kept
to do

c. $12x + 15 = 5x + 62$
 $\begin{array}{r} 12x + 15 = 5x + 62 \\ -15 \quad -15 \end{array}$

$$\begin{array}{r} 12x = 5x + 47 \\ -5x \quad -5x \\ \hline \end{array}$$

$$7x = 47$$

$$\begin{array}{r} 7x = 47 \\ \underline{7} \quad \underline{7} \\ \hline \end{array}$$

$x = 7$ 02

b. $43x + 37 = 56x + 24$
 $\begin{array}{r} 43x + 37 = 56x + 24 \\ -24 \quad -24 \end{array}$

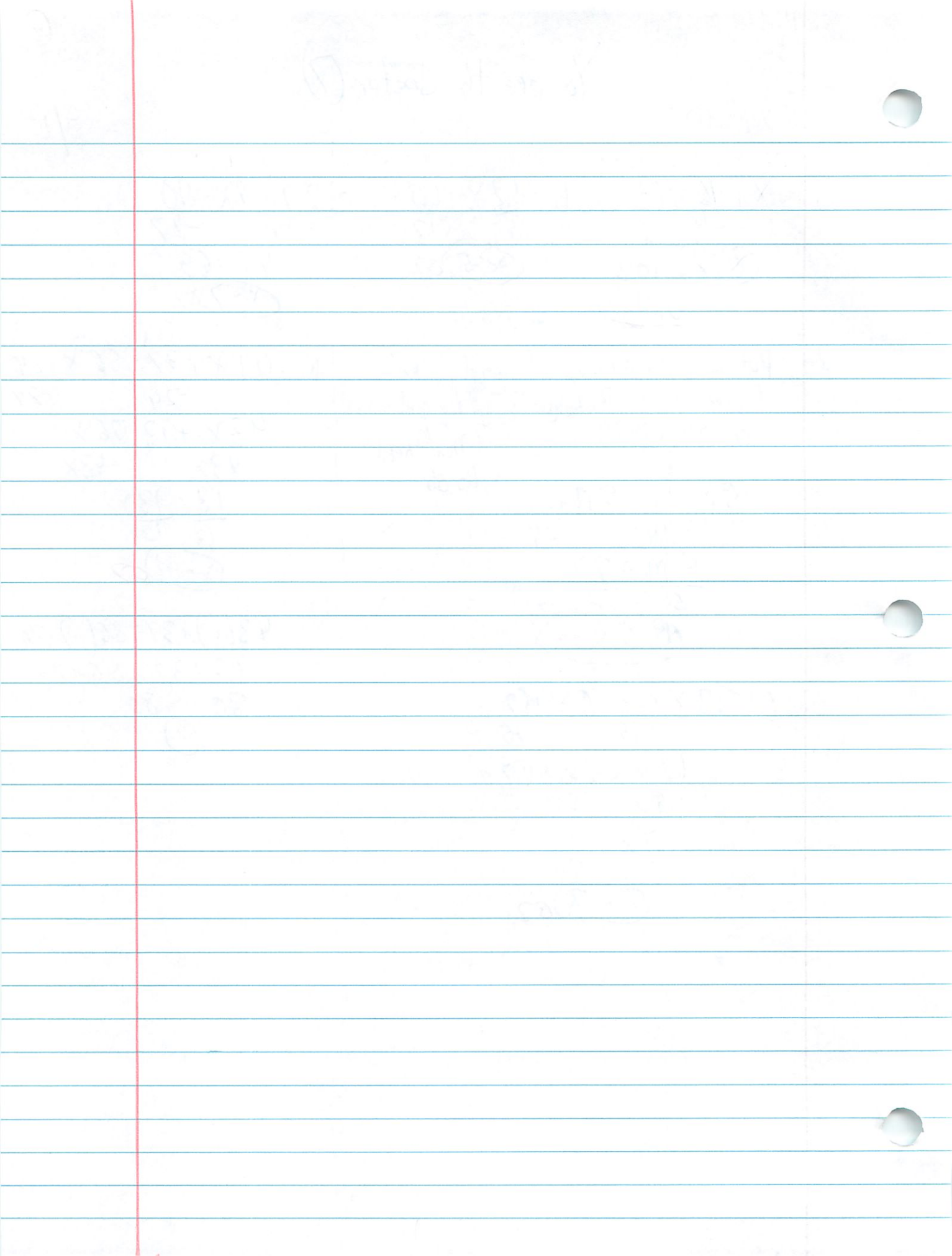
$$\begin{array}{r} 43x + 13 = 56x \\ -43x \quad -43x \\ \hline \end{array}$$

$$\begin{array}{r} 13 = 13x \\ \underline{13} \quad \underline{13} \end{array}$$

$x = 1$ 07

✓
 $43(1) + 37 = 56(1) + 24$
 $43 + 37 = 56 + 24$
 $80 = 80$

✓



Michael & Bone Dr
Behl
IA62H
15 Sep 2005

Letters, H, Star, (8)

(9)

9/15

Part 1

1. $5 + 6q$ at $(q=9)$
 $5 + 6(9)$
 $5 + 54$
 (59)

2. $3z + 20$ $(z=2)$
 $3(-8) + 20$
 $-24 + 20$
 $(-4) C$

3. $15 - 4x$ $(x=-1)$
 $15 - 4(-1)$
 $15 + 4$
 $(19) C$

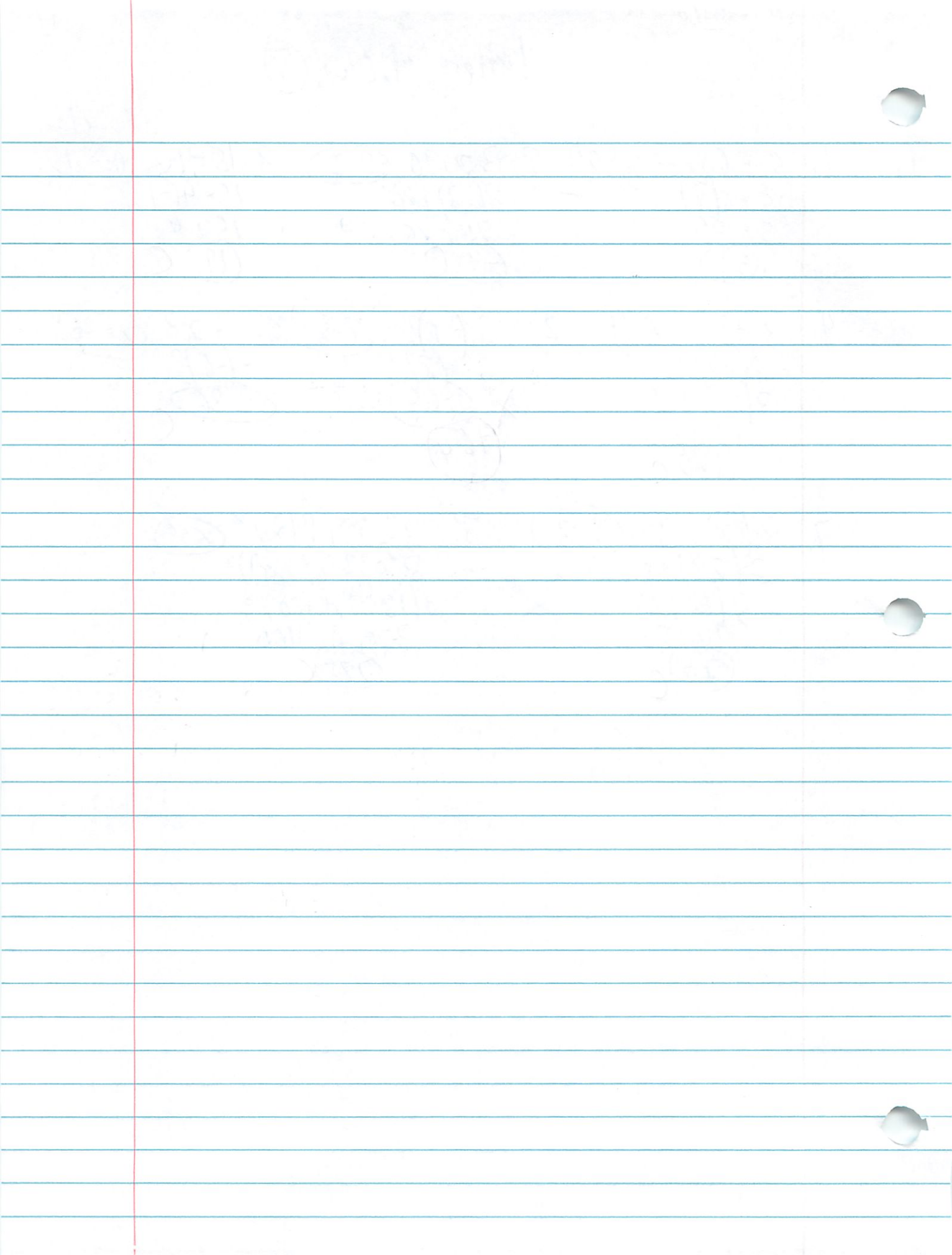
4. $3 + 2 + 7$ $(t=-2)$
 $3(-2)^2 + 7$
 $3(4) + 7$
 $12 + 7$
 $(19) C$

5. $(-r)^2$ $(r=8)$
 $(-8)^2$
 (-64)
 $(+64)$

6. -2^2 $(z=-6)$
 $-(-6)^2$
 $(-36) C$

7. $3(2^k) + 5$ $(k=3)$
 $3(2^3) + 5$
 $3(8) + 5$
 $24 + 5$
 $(29) C$

8. $3 \times 3 + (4x)^2$ $(x=5)$
 $3(5)^3 + (4(5))^2$
 $3(125) + (20)^2$
 $375 + 400$
 $(775) C$



Michael Plosinger
Behl
IAG 2H
19 Sept 2005

More Letters, #, Bags (9)

(10)

9/19

Part 1

1a $5(-2)^2 + 3(-2) + 4$
 $5(4) + (-6) + 4$
 $20 + -6 + 4$
 $14 + 4$
 $(18) \text{ calc } \checkmark$

$6 - (-3)^3 + 2(-3)^2 + 4(-3)$
 $27 + 2(9) + -12$
 $27 + 18 - 12$
 $45 - 12$
 $(33) \checkmark$

c $((-7)^2 + 2)((-7) - 1) - ((-7) - 1)((-7)^2 + 3)$
 $(49 + 2)(-8) - (-8)(49 + 3)$
 $(51)(-8) - (-8)(52)$
 $-408 - (-416)$
 $-408 + 416$
 (8)

use Calc to check

Calc Answer = 8 $\checkmark$

d $6((-5) + 4) - 3(-5)((-5) - 1)$
 $6(-1) + 15(-6)$

$-6 + -96$
 $(-96) \checkmark$

e $(7+5)(7^2-4) - (7-5)(7^2+4)$
 $(12)(49-4) - (2)(49+4)$
 $(12)(45) - 2(53)$
 $540 - 106$
 $(434) \checkmark$

f $(-5)^3 + (2(-5))^2$
 $-125 + (-10)^2$
 $-125 + 100$
 $(-25) \checkmark$

g $7(-6)^2 - 5(-6) + 9$
 $2(36) + 30 + 9$
 $72 + 39$
 $(111) \checkmark$

Part 2



Part 23, a $15x + 43 = 37x + 12$ b. $52x + 19 = 23 + 16x$

$$\begin{array}{r} 43 = 22x + 12 \\ -12 \quad -12 \\ \hline 31 = 22x \end{array}$$

$$\frac{31}{22} = x$$

$$\boxed{1.409 = x}$$

or m

$$\begin{array}{r} 36x + 19 = 23 \\ -19 \quad -19 \\ \hline 36x = 4 \end{array}$$

$$\frac{36x}{36} = \frac{4}{36}$$

$$\boxed{x = .1111}$$

Units

c $5t + 12t + 13 = 8t + 19$

$$\begin{array}{r} 17t + 13 = 8t + 19 \\ -8t \quad -8t \\ \hline 9t + 13 = 19 \end{array}$$

$$\begin{array}{r} 9t + 13 = 19 \\ -13 \quad -13 \\ \hline 9t = 6 \end{array}$$

$$\frac{9t}{9} = \frac{6}{9}$$

$$\boxed{t = .667}$$

d $9a + 6 + 3a + 7 = 10a + 21 + 6a$

$$\begin{array}{r} 12a + 13 = 16a + 21 \\ -12a \quad -12a \\ \hline 13 = 4a + 21 \end{array}$$

$$\begin{array}{r} 13 = 4a + 21 \\ -21 \quad -21 \\ \hline -8 = 4a \end{array}$$

$$\frac{-8}{4} = \frac{4a}{4}$$

$$\boxed{-2 = a}$$

e $3r + 4 + 2r = 7 + r + 4r$

$$5r + 4 = 7 + 5r$$

Doesn't work

No Solution

Michael Plasmer
Behl
ING 2 H
11 Sept 2005

Back to the Lake

p29-30

8/19

1. $2 + 4x + 2 = 10$

$4x + 4 = 10$

$-4 -4$

$4x = 6$

$\frac{4}{4} \frac{6}{4}$

$x = 1.5 \text{ miles}$

unit

$x = 2$ more
round
lake

2. $\begin{matrix} x & y \\ \text{In} & \text{Out} \end{matrix}$

$\begin{matrix} 1 & 0 \\ 2 & 1 \end{matrix}$

$+3 \begin{bmatrix} 1 & 1 \\ 2 & 2 \end{bmatrix}$

$\begin{matrix} 3 & 3 \\ 4 & 4 \end{matrix}$

$\begin{matrix} 5 & 5 \\ 6 & 6 \end{matrix}$

$\begin{matrix} 7 & 7 \\ 8 & 8 \end{matrix}$

$\begin{matrix} 9 & 9 \\ 10 & 10 \end{matrix}$

Is not possible in story

$-1.5 \quad -1.5$

$y = -1.5x + 3.5$

not correct

Wrote wrong + not linear

2. $2 + a(3) + 2 = 10$

$3a + 4 = 10$

$-4 -4$

$3a = 6$

$\frac{3}{3} \frac{6}{3}$

$a = 2$

$\begin{matrix} \text{In}(x) & \text{Out}(y) \\ 0 & 4.5 \end{matrix}$ Not possible

$\begin{matrix} 1 & 8.25 \\ 2 & 3 \end{matrix}$

$\begin{matrix} 3 & 2 \\ 4 & 1.5 \end{matrix}$

$\begin{matrix} 5 & 1.2 \\ 6 & 1 \end{matrix}$

$\begin{matrix} 7 & 0.75 \\ 8 & 0.5 \end{matrix}$

$\begin{matrix} 9 & 0.25 \\ 10 & 0 \end{matrix}$

Do calc

$\frac{6}{x} = y$

$2 + a(5) + 2 = 10$

$5a + 4 = 10$

$-4 -4$

$5a = 6$

$\frac{5}{5} \frac{6}{5}$

$a = 1.2$

3. $y = 2 + a(N) + 2 = 10$ = Solve for a

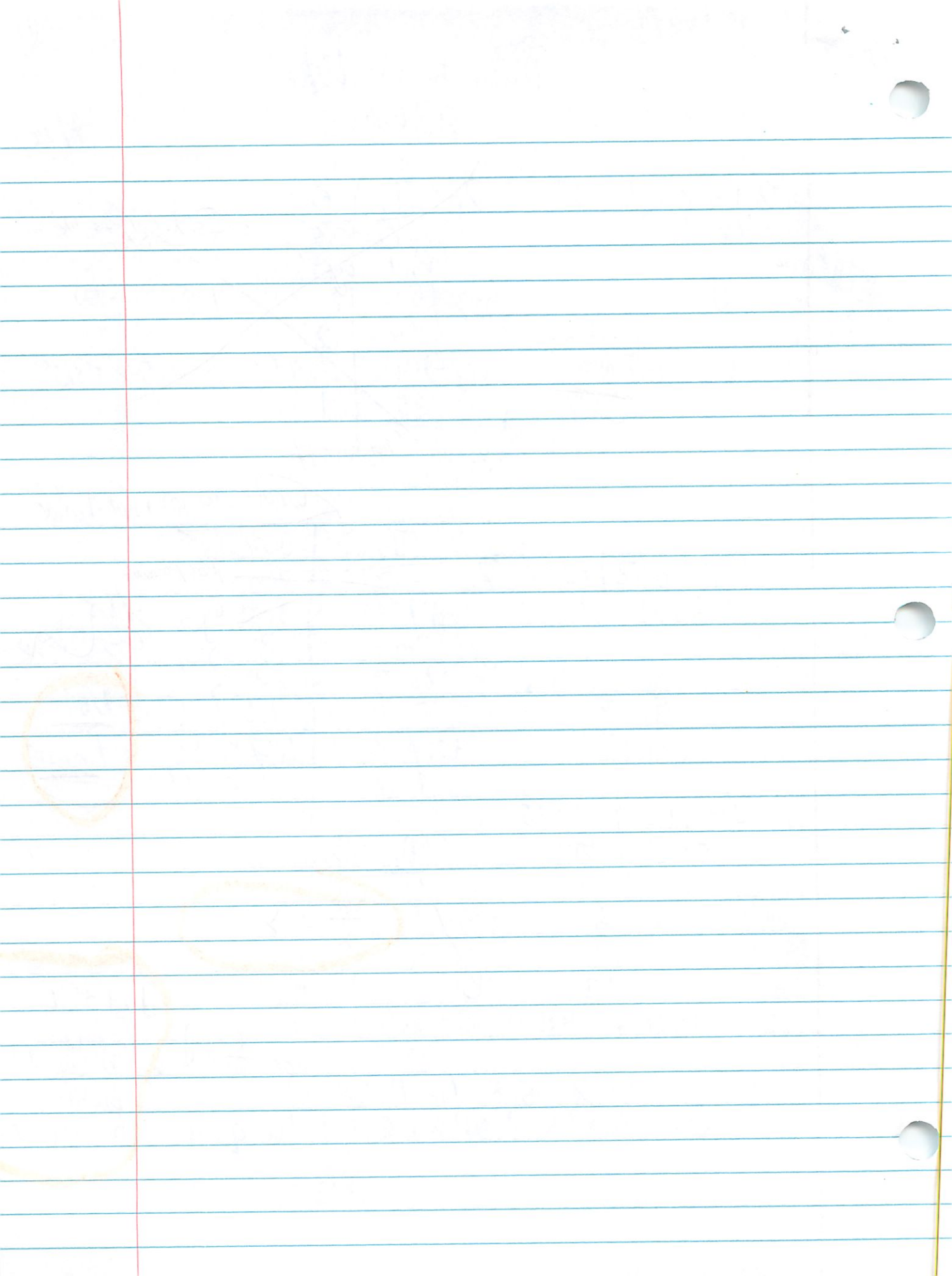
or $y = .90x + 5.8$ for linear

$y = .30x^2 + -3.04x + 8.43$ for quad.

or $\frac{6}{n} = d$

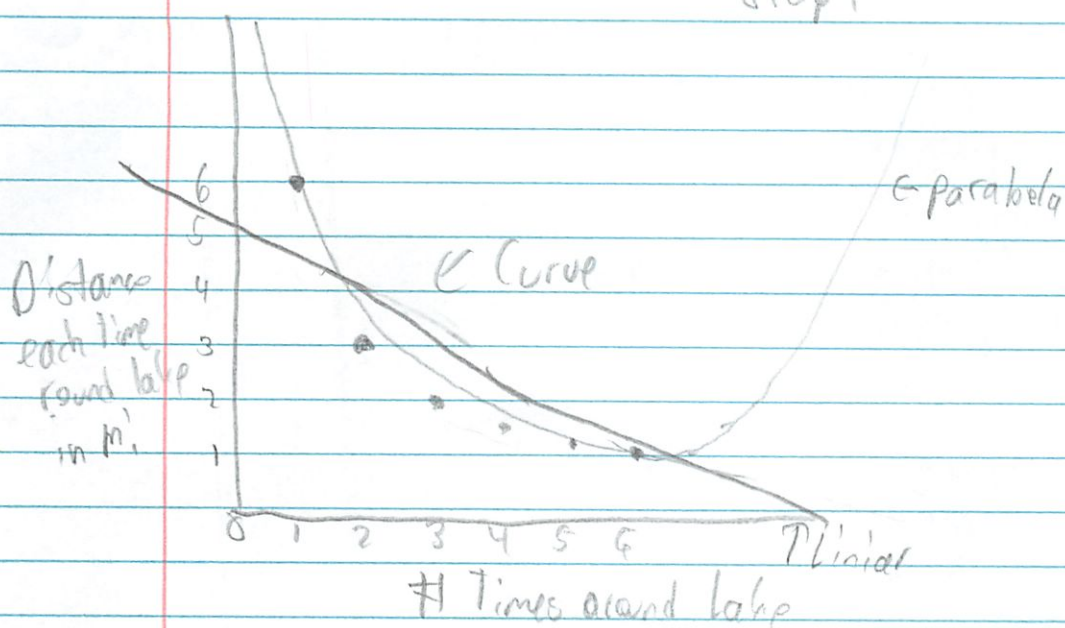
Just think in terms of word problem not equation

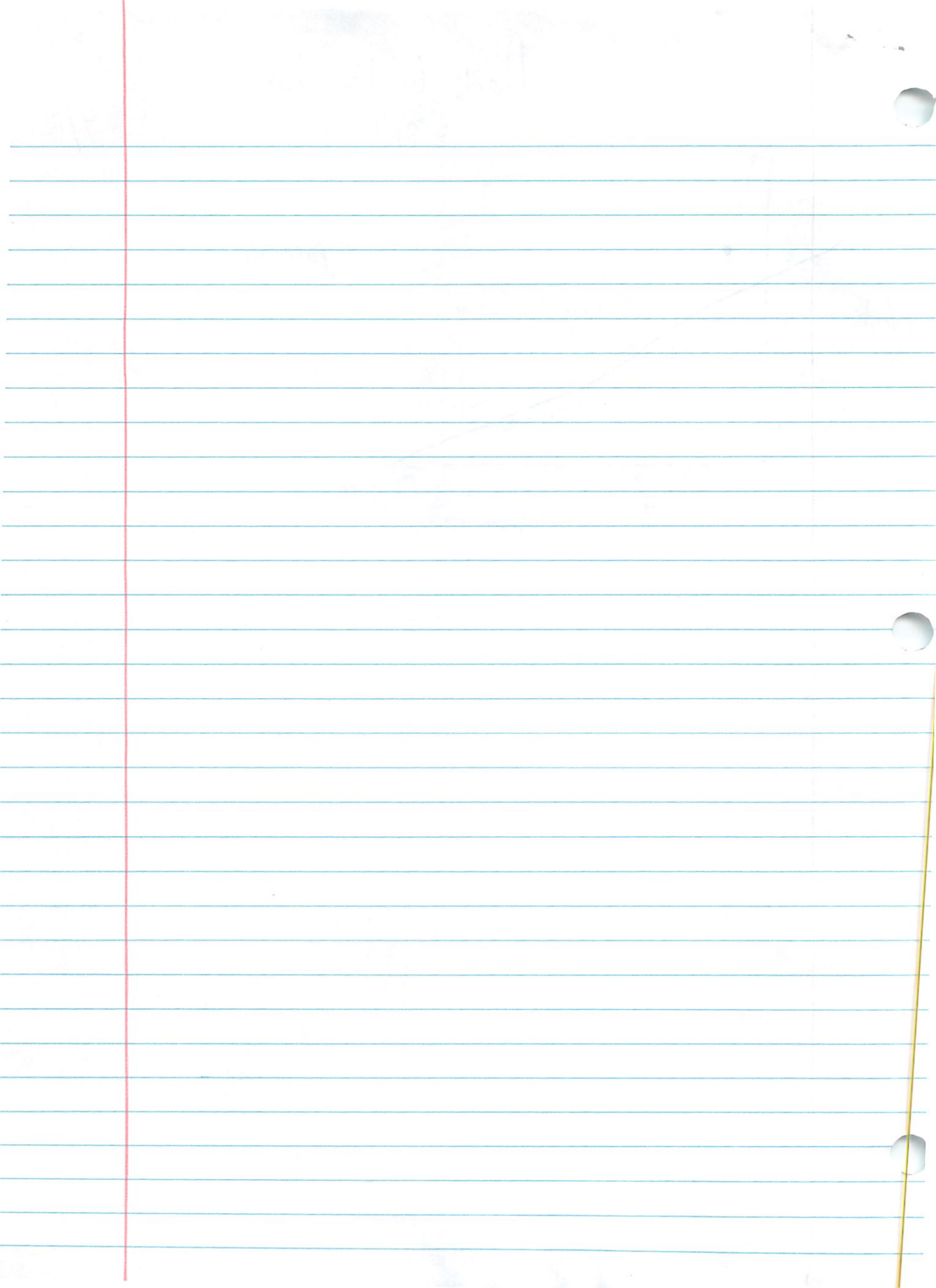
4. See next page



Back to the Lake Graph

9/19





16/16



Name Michael Plasmer
Period 28
Date 19 Sept 2005

Solving Equations

Directions: Solve each of these equations for x. Be sure to show all of your steps.

$$\begin{array}{r} 1) \quad 39 + x = 68 \\ -39 \quad -39 \\ \hline x = 29 \end{array}$$

$$\begin{array}{r} 2) \quad 5x = 65 \\ \underline{5} \quad \underline{5} \\ x = 13 \end{array}$$

Didn't
check

Don't forget

$$\begin{array}{r} 3) \quad 2x + 3 = 17 \\ -3 \quad +3 \\ \hline 2x = 14 \\ \underline{2} \quad \underline{2} \\ x = 7 \end{array}$$

$$\begin{array}{r} 4) \quad -3x + 15 = 0 \\ -15 \quad -15 \\ \hline -3x = -15 \\ \underline{-3} \quad \underline{-3} \\ x = 5 \end{array}$$

$$\begin{array}{r} 5) \quad 3x + 2 = -58 \\ -2 \quad -2 \\ \hline 3x = -60 \\ \underline{3} \quad \underline{3} \\ x = -20 \end{array}$$

$$\begin{array}{r} 6) \quad -2x - 5 = 33 \\ +5 \quad +5 \\ \hline -2x = 38 \\ \underline{-2} \quad \underline{-2} \\ x = -19 \end{array}$$

$$\begin{array}{r} 7) \quad \frac{1}{2}x - 5 = 9 \\ \quad \quad +5 \quad +5 \\ \hline \frac{1}{2}x = 14 \\ \times 2 \quad \times 2 \\ \hline x = 28 \end{array}$$

$$\begin{array}{r} 8) \quad -7x = 98 \\ \underline{-7} \quad \underline{-7} \\ x = -14 \end{array}$$

Michael Plasencia
Bohl
JAG 7H
21 Sept 2005

Board Problems

9/21

13

9/21

1. $\frac{1}{3}x + 6 = -8$

$$\frac{1}{3}x = -14$$

$$x = -42$$

✓

Solve

Must show work

2. $7x - 8 - 3x = 29 - 5$

$$4x - 8 = 24$$

$$\frac{4x}{4} = \frac{32}{4}$$

$$x = 8$$

✓

3. $5x + 3(x + 4) = 28$

$$5x + 3x + 12 = 28$$

$$8x = 16$$

$$x = 2$$

✓

Evaluate

Can only do calc

1. $((-3)^2 + 4)(5 - 8) + ((-3) + 9)^2 \times ((-3) + 12)$

$$(9 + 4)(-3) + (6)^2 \times (9)$$

$$13(-3) + 36 \times 9$$

$$-39 + 324$$

$$285$$

✓

Copy Error

$$(4 + (12)^2) - 10$$

2. $(12)((12)^2 - 10), 4 - (12)$

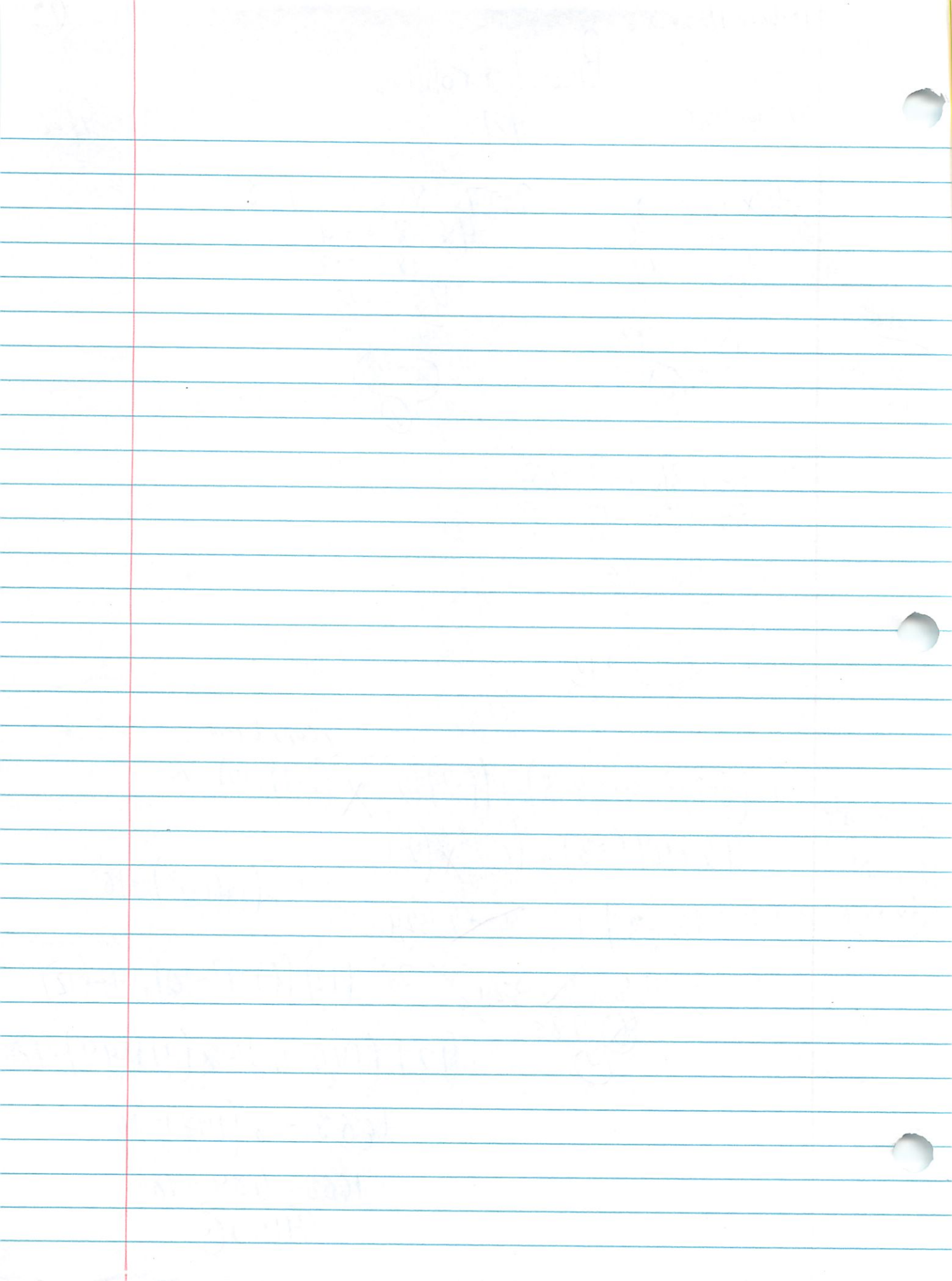
$$(12)(144 - 10) - 8(4 + 144) - 10$$

$$1608 - 8(148) - 10$$

$$1608 - 1184 - 10$$

$$414$$

✓



Michael Plasmé or
Behl
TAG 7H
21 Sept 2005

Line it up (11)

(14)

9/21

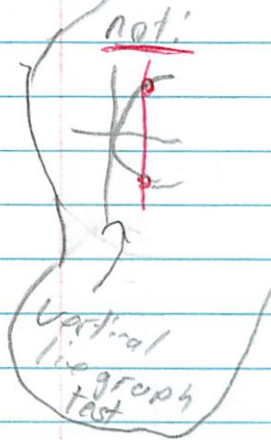
1. Introduce $f(x) = 3x + 2$

$f(x)$ is a function
for a given x value, only y
value equals it

a $f(1) = 3(1) + 2$ b: $f(2) = 3(2) + 2$ c: $f(3) = 3(3) + 2$
 $f(1) = 3 + 2$ $f(2) = 6 + 2$ $f(3) = 9 + 2$
 $f(1) = 5$ $f(2) = 8$ $f(3) = 11$

b

x	$f(x)$
1	5
2	8
3	11



c: see graph

d: Yes, it is a straight line and only 1 point intercepts it

2. a (0, -1)

	In	Out	
12	0	-1	$\frac{4}{2}x$
	2	3	$2x + 0$
17	4	7	

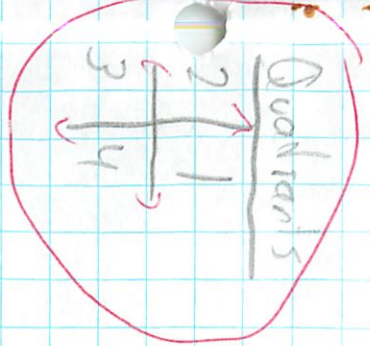
3. $y = m \times 1b$
 slope x-intercept

A rule. Has a line

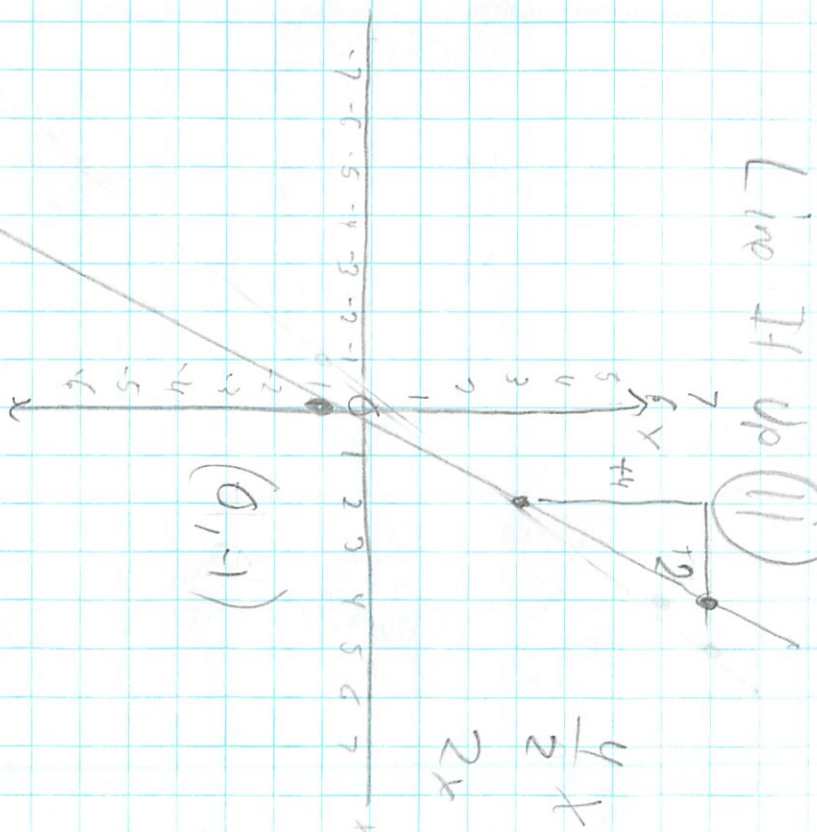
Parabola = $y = x^2$ or $\cup$
 Not linear

not a function



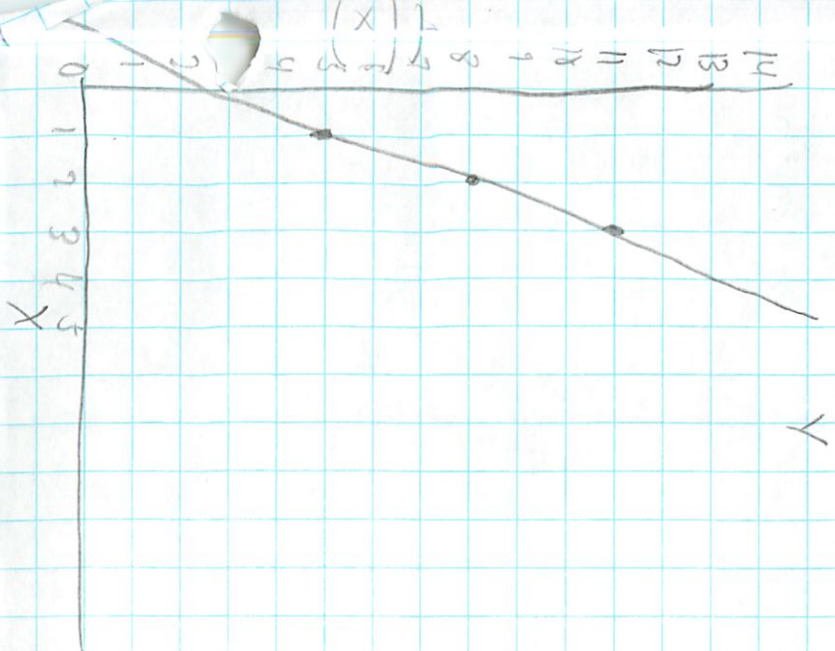


Line 11 up (11)

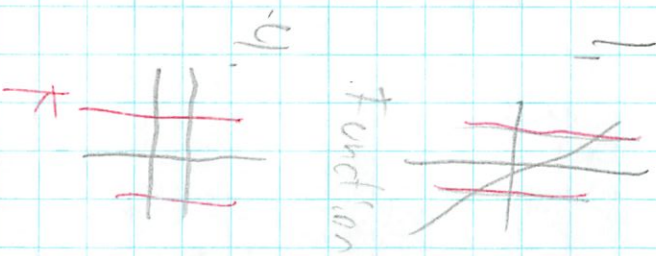


9/24

①



Vertical Line Test



function



Not all parabolas



Not function

Straight vertical line is not a function

Not all
the same

1000

2000



52/52



Name Michael Plasmeier
Period 2
Date 9/23/05

Solve - It Quiz # 1

Directions: For each of the problems below, write an equation that represents the situation. Be sure you identify what the variables represent. Once you have your equation, solve the problem. Make sure you show ALL of your work.

1. Mike is trying to decide on what video store to rent DVD's from. DVD-R-US charges a \$20 membership fee and \$2.50 a rental. Kevin's DVD store charges a \$10 membership fee and \$ 5.00 a rental. If Mike is going to rent 5 DVDs what store should he rent from and why?

Equation

DVD-R-US - $y = 2.50x + 20$

Kevin's $y = 5x + 10$

try (5) $y = 2.50(5) + 20$

R-US $12.50 + 20$

Equations:

(32.50)

$y = 5(5) + 10$

$y = 25 + 10$

$y = 35$

Kevin's Store

Variables:

$x =$ a rental of 1 DVD

$y =$ total cost of 5 DVDs + Membership Fee

Answer:

DVD-R-US is 2.50^{+20} cheaper than Kevin's store.

Though he should join Netflix unlimited DVDs, 3 at a time, \$18 a month, free shipping, 35000 titles, no late fees, no gas

Incomplete Sentence

2. Brent is thinking about switching his service. Right now Brent has Ring-Ring service. Ring-Ring charges a \$25 joining fee and 20 cents per minute. The other service, Dial-Tone, charges a \$10 joining fee and 50 cents per minute. Brent doesn't use this cell phone that much. If Brent plans on talking on the phone for 50 minutes, which phone service would be best? Why? What if Brent goes over the 50 minutes?

$$\text{Ring Ring } y = .20x$$

$$\text{Dial Tone } y = .50x + 10$$

x: Minutes talked

y: total cost for 50 minutes

$$\text{Ring } y = .20(50)$$

$$y = 10$$

$$\text{Dial Tone } y = .50(50) + 10$$

$$y = 25 + 10$$

$$y = 35$$

Equations: _____

Variables: _____

Answers:

This is a no brainer. Because Brent already has Ring-Ring service, he does not have to pay their joining fee. Because they also have a lower per-minute rate and no joining fee (already a member), Brent should be worrying about other things and keep Ring-Ring service. (to avoid the \$175 early termination fee!) No matter how many minutes he talks, Ring Ring is best.

P.S. Cell phones don't have dial tones

3. Evaluate each of the problems below.

a. $2b^3 - 12b + 32$ when $b = -5$

$2(-5)^3 - 12(-5) + 32$
 $2(-125) + 60 + 32$
 $-250 + 92$
 -158 (check)

b. $(2c + 5)^2 + 7(c - 9) + 10 \cdot 6c$ when $c = 7$

$(2(7) + 5)^2 + 7(7 - 9) + 10(6(7))$
 $(14 + 5)^2 + 7(-2) + 10(42)$
 $361 - 14 + 420$
 767

c. $(n^4 + 3)(n - 2) - (n + 2)(n^2 + 2)$ when $n = -2$

$(n^4 + 3)(n - 2) - (n + 2)(n^2 + 2)$
 $(16 + 3)(-4) - (0)(4 + 2)$
 $19(-4) - 0$
 -76 (check)

Directions: Solve each of these problems for x . Be sure to show ALL of your work!

4. $7 - 2x = 15$

$-7 -7$
 $-2x = 8$
 $\frac{-2x}{-2} = \frac{8}{-2}$
 $x = -4$
 $x = -4$

(check)
 $7 - 2(-4) = 15$
 $7 - (-8) = 15$
 $7 + 8 = 15$
 $15 = 15$
 $\checkmark$

5. $6 = 11 - 2.5x$

$-11 -11$
 $-5 = -2.5x$
 $\frac{-5}{-2.5} = \frac{-2.5x}{-2.5}$
 $2 = x$

$6 = 11 - 2.5(x)$
 $6 = 11 - 5$
 $6 = 6$
 $\checkmark$

6. $-23 = -5x + 2$

$-23 -2$
 $-25 = -5x$
 $\frac{-25}{-5} = \frac{-5x}{-5}$
 $5 = x$

$-23 = -5(5) + 2$
 $-23 = -25 + 2$
 $-23 = -23$
 $\checkmark$

Directions: Solve each of these problems for x. Be sure to show ALL of your work!

7. $2x + 5 = 4x - 7$

$$\begin{array}{r} -2x \quad -2x \\ 5 = 2x - 7 \\ +1 \quad +1 \\ 12 = 2x \\ \frac{12}{2} = \frac{2x}{2} \end{array}$$

8. $4 + 3x = 9x - 8$

$$\begin{array}{r} -3x \quad -3x \\ 4 = 6x - 8 \\ +8 \quad +8 \\ 12 = 6x \\ \frac{12}{6} = \frac{6x}{6} \end{array}$$

9. $\frac{1}{7}x + 5 = 10$

$$\begin{array}{r} -5 \quad -5 \\ \frac{1}{7}x = 5 \\ \times 7 \quad \times 7 \\ x = 35 \end{array}$$

10. $12 - 3x - 6 = 6x - 54 + x$

$$\begin{array}{r} 6 - 3x = 7x - 54 \\ +3x \quad +3x \\ 6 = 10x - 54 \\ +54 \quad +54 \\ 60 = 10x \\ \frac{60}{10} = \frac{10x}{10} \end{array}$$

11. $6x - 2 + 4x + 8 - 2x = 24 - 2x$

$$\begin{array}{r} 8x - 2 + 8 = 24 - 2x \\ 8x + 6 = 24 - 2x \\ +2x \quad +2x \\ 10x + 6 = 24 \\ -6 \quad -6 \\ 10x = 18 \\ \frac{10x}{10} = \frac{18}{10} \\ x = 1.8 \end{array}$$

Check

$$\begin{array}{l} 2(6) + 5 = 4(6) - 7 \\ 12 + 5 = 24 - 7 \\ 17 = 17 \\ \text{✓} \end{array}$$

$$\begin{array}{l} 4 + 3(2) = 9(2) - 8 \\ 4 + 6 = 18 - 8 \\ 10 = 10 \\ \text{✓} \end{array}$$

$$\begin{array}{l} \frac{1}{7}(35) + 5 = 10 \\ 5 + 5 = 10 \\ 10 = 10 \\ \text{✓} \end{array}$$

$$\begin{array}{l} 12 - 3(6) - 6 = 6(6) - 54 + 6 \\ 12 - 18 - 6 = 36 - 54 + 6 \\ -6 - 6 = -12 \\ -12 = -12 \\ \text{✓} \end{array}$$

$$\begin{array}{l} 6(1.8) - 2 + 4(1.8) + 8 - 2(1.8) = 24 - 2(1.8) \\ 10.8 - 2 + 7.2 + 8 - 3.6 = 24 - 3.6 \\ 8.8 + 15.2 - 3.6 = 20.4 \\ 24 - 3.6 = 20.4 \\ 20.4 = 20.4 \\ \text{✓} \end{array}$$

Michael Ploner
Behl
JAS 2H
29/9/05

Graph Solves Problem

(15)

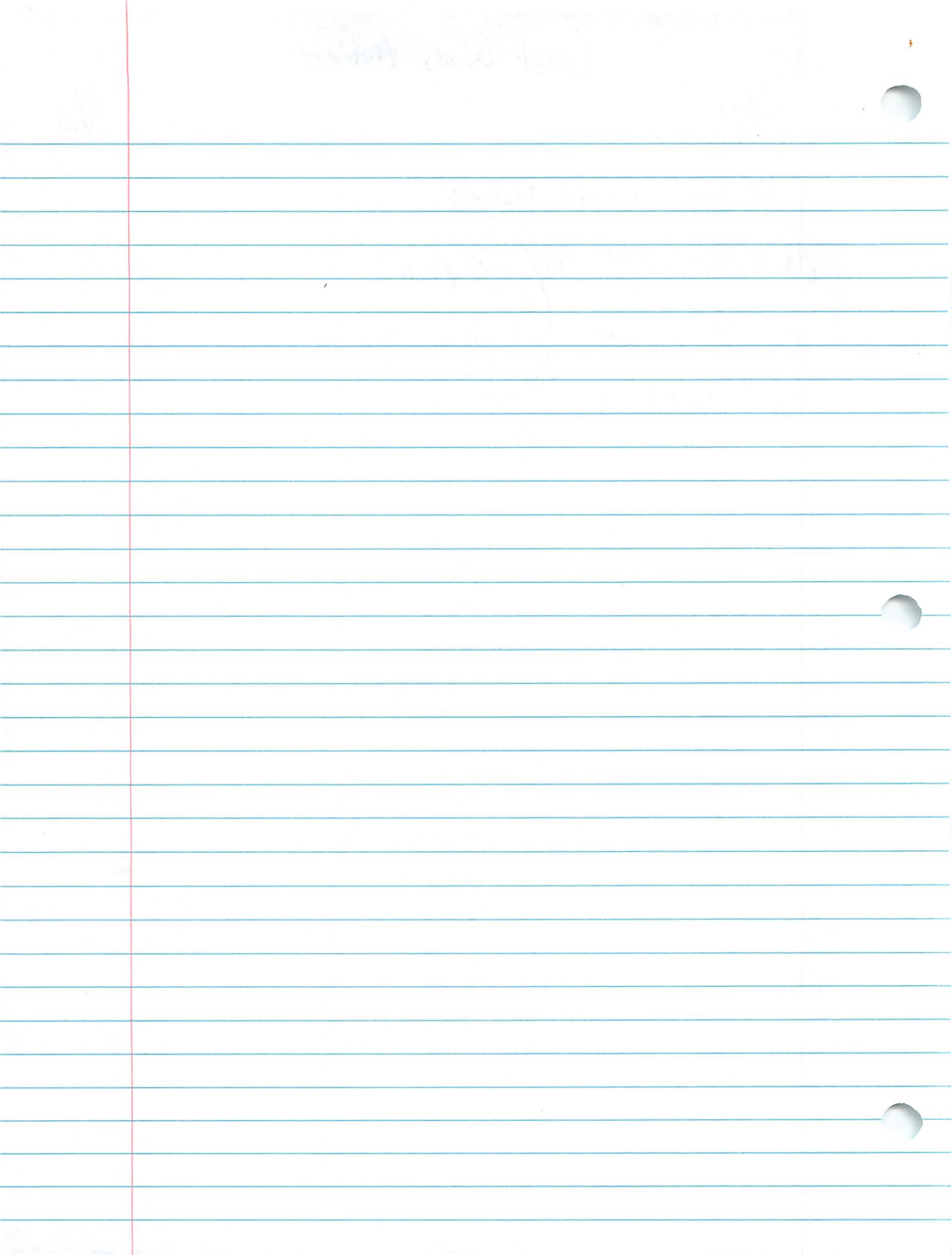
9/29

1. a 111 people bought tickets

b \$1600 profit for 300 people

2. a 3.5355 sec

b 576 ft



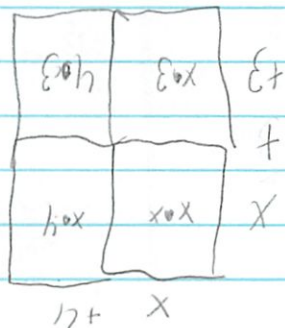
A Lot of Changing Sides

p39

10/2

(16)

1

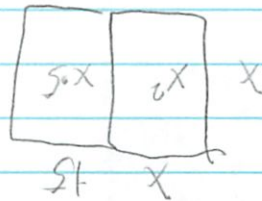


$$A = (x+4)(x+3)$$

$$A = x^2 + 4x + 3x + 12$$

$$A = x^2 + 7x + 12$$

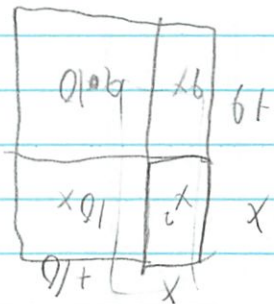
2



$$A = (x+5)(x+5)$$

$$A = x^2 + 10x + 25$$

3



$$A = (x+10)(x+9)$$

$$A = x^2 + 19x + 90$$

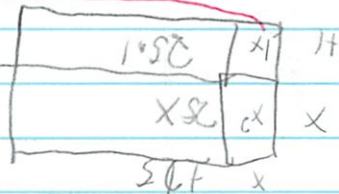
parabola

$$A = (x+25)(x+1)$$

$$A = x^2 + 26x + 25$$

Don't forget the 1x

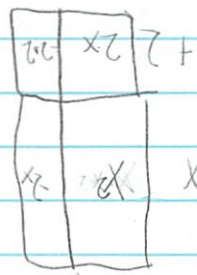
4



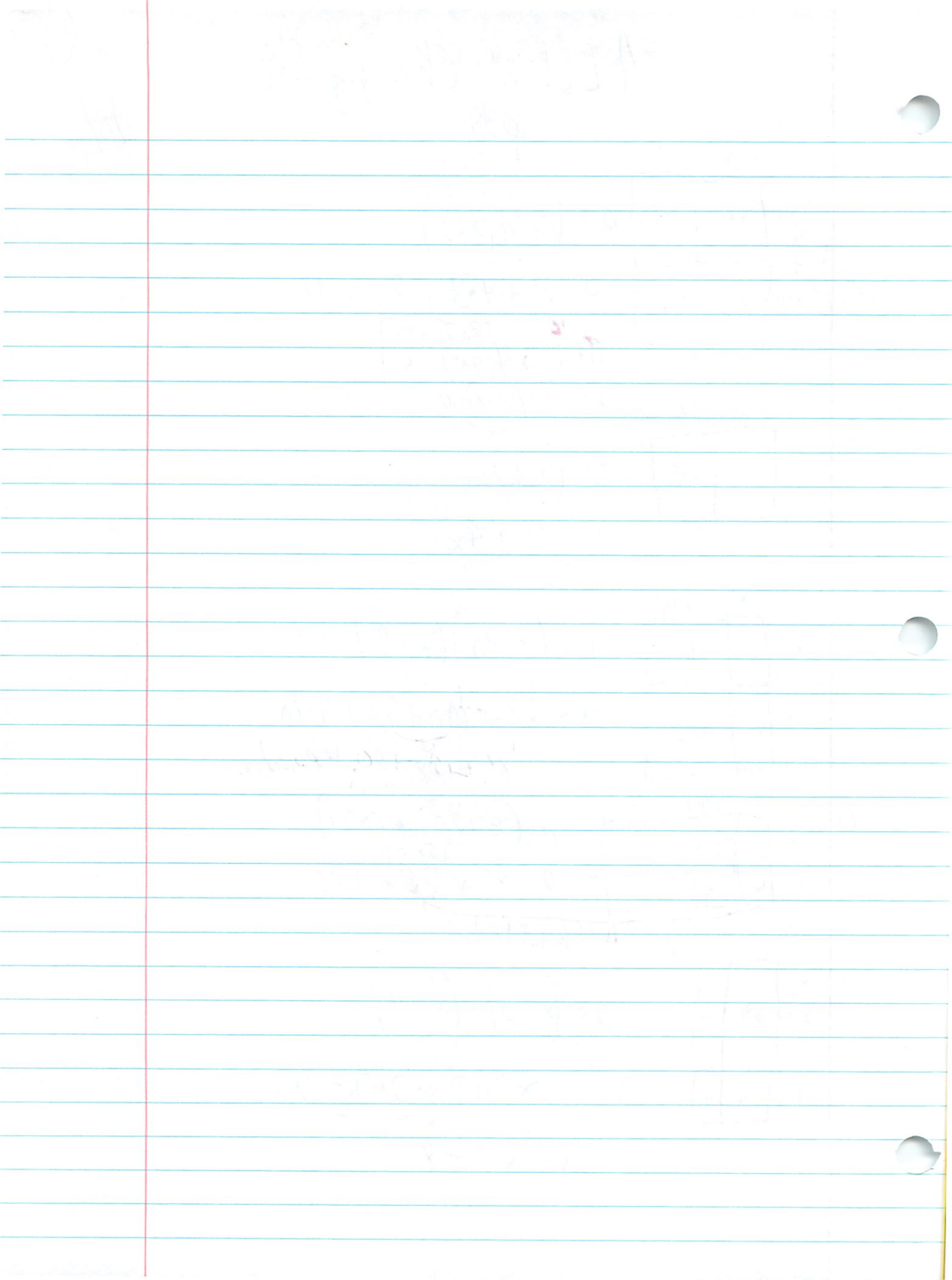
$$A = (x+2)(x+12)$$

$$A = x^2 + 14x + 24$$

5



$$y = x^2 - 4$$



Michael Paschler
Behl
TAG 2H9
3 Oct 2005

Who's Right? (12)

(17)

10/3

0	2
I_n	Out
3	8
5	12
9	20
15	32
x	?

$$12 \begin{bmatrix} 3 & 8 \\ 5 & 12 \end{bmatrix} + 4$$

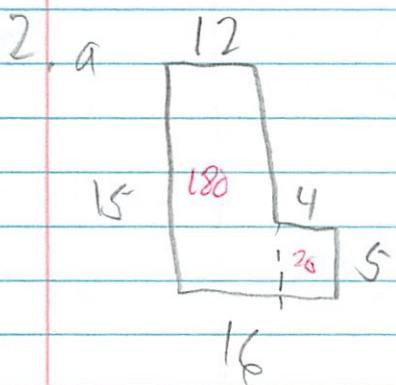
$$\frac{4}{2} (2x+2)$$

I think it is $2x+2$ (The proper rule)

The other way will work to because of the distributive property

$$2(x+1) \rightarrow \text{same}$$

$$2x+2$$

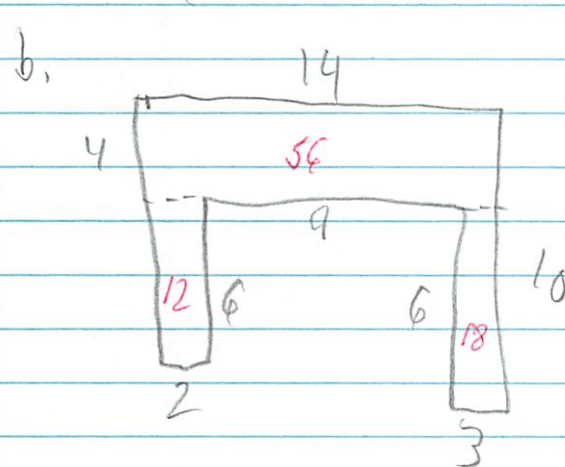


$$4 \times 5 = 20$$

$$15 \times 12 = 180$$

$$\underline{200 \text{ sq feet}}$$

or 200 ft²

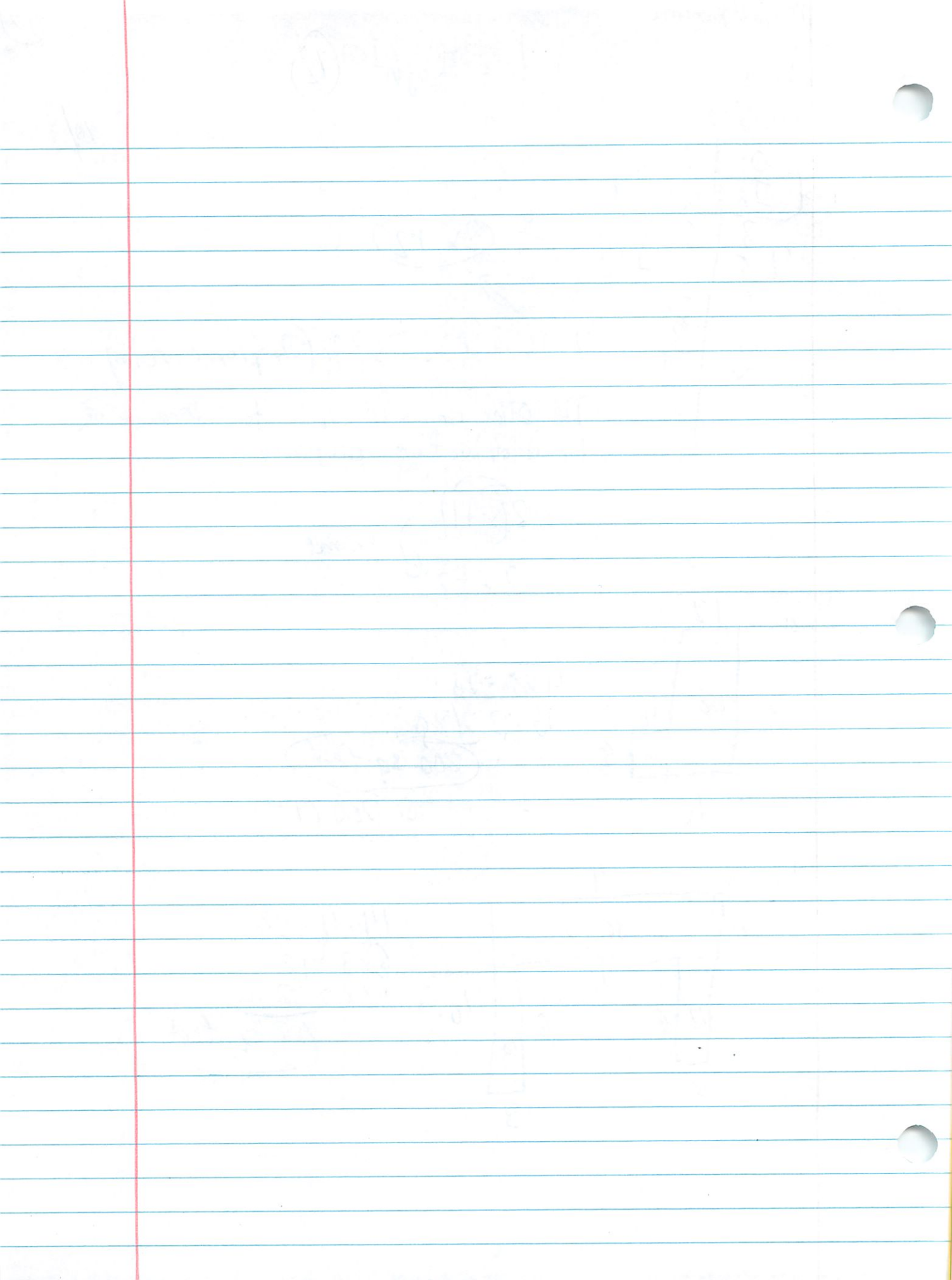


$$14 \times 4 = 56$$

$$6 \times 3 = 18$$

$$6 \times 2 = 12$$

$$\underline{86 \text{ sq feet}}$$



Box Method Practice

Practice

10/3

1.

	x	$+6$
x	x^2	$6x$
$+2$	$2x$	12

$$y = x^2 + 8x + 12$$

2.

	x	-5
x	x^2	$-5x$
$+4$	$4x$	-20

$$y = x^2 + 4x - 5x - 20$$

$$y = x^2 - 1x - 20$$

3.

	x	$+7$
x	x^2	$7x$

$$y = x^2 + 7x$$

Can't say $2x+7$ wrong must use box

r	4
r^2	$4r$
$+3$	12

$r^2 + 7r + 12$

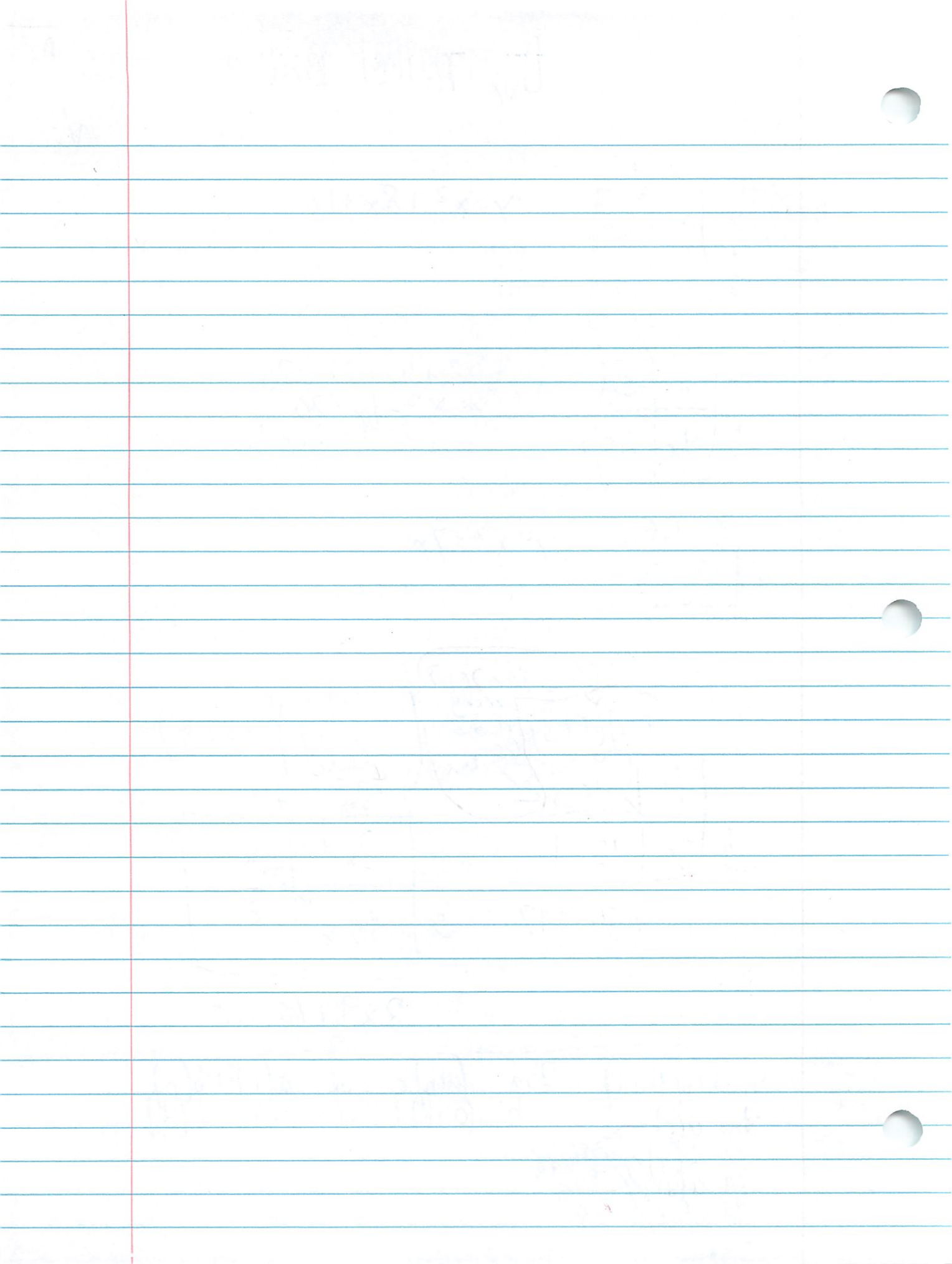
$3x$	$+1$
$3x^2$	x
$+5$	5

$3x^2 + 16x + 5$

Distributive
Are
p43

4. $(a+b)(c+d)$ 2. $a(a+b)c$ or $a(c) + b(c)$
 1. $a(c)$ b. $(a+b)d$ or $a(d) + b(d)$
 2. $b(c)$
 3. $a(d)$
 4. $b(d)$

add all
up for
#4



Michael Plasmior
Behl
IA 2 H9
3 Oct 2005

Why Equivalent (13)

(18)

10/3

1. All the explanations are correct. How - I understand all methods
Sandy - will not work for -, whole, fraction, decimals

2. I think Randy because he used math (sort of distributive property) to explain the problem.
Dandy's explanation is almost like Randy.

3. They all are convincing because I understand how they all work
Randy - distributive property
Sandy - try it
Dandy - picture - Box method

4. $3(x+4)$ is 3 times $x+4$ or $(x+4) + (x+4) + (x+4)$
 $3x + 12$ or $3x + 12$

More

Examples

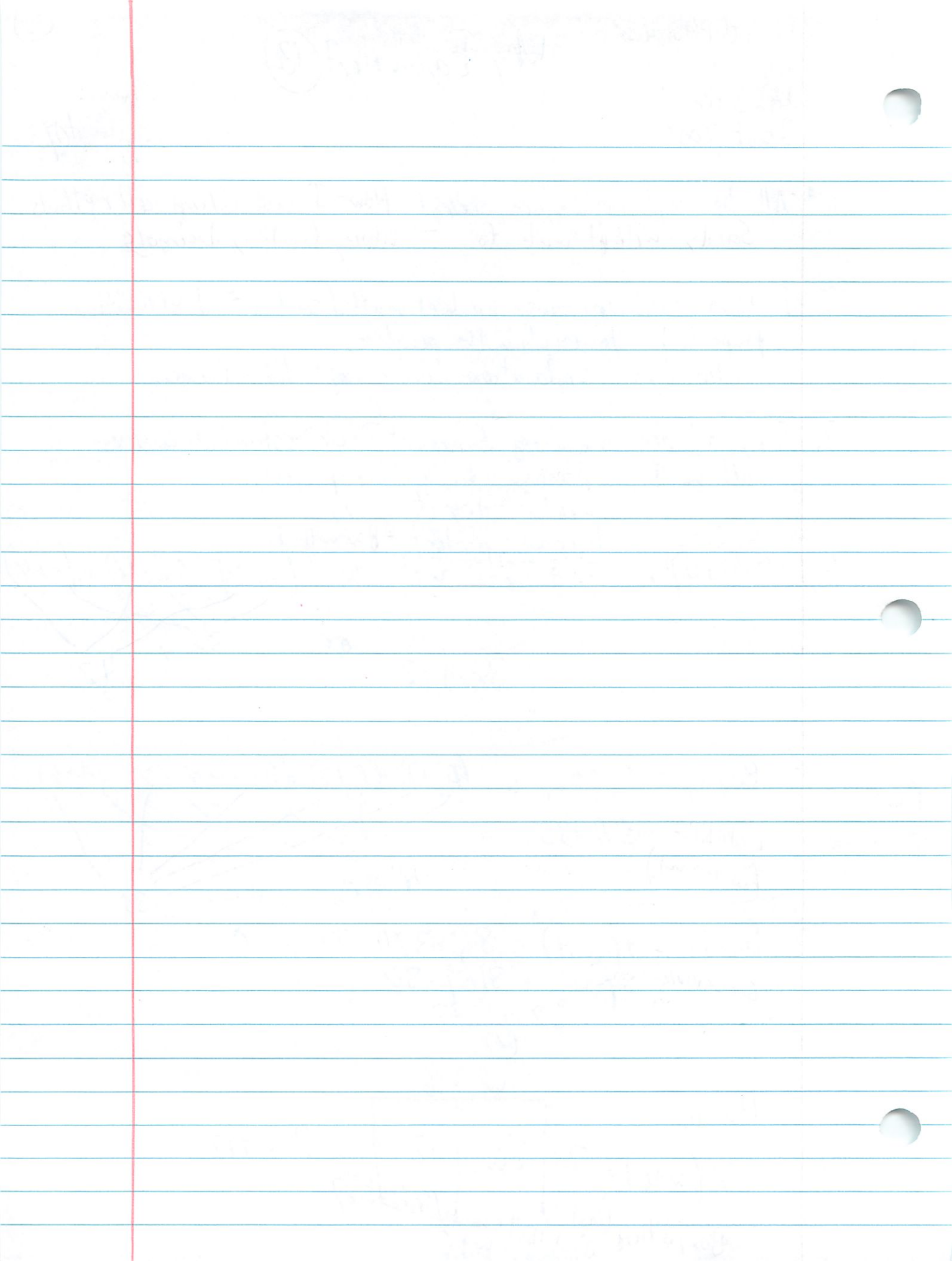
Randy $3(A+7)$ or $(A+7) + (A+7) + (A+7) + (A+7) + (A+7)$
Distributive (write out) $5A + 35$
 $5A + 35$

Sandy $8(y-4) = 8y - 32$ If $y = 0$
Guess work $8(-4) = 8(0) - 32$
 $-32 = -32$
(1)

Dandy

w	6
2w	12

$2(w+6) = 2w + 12$
Box method (sort of distributive w/ picture)
 $w+6$

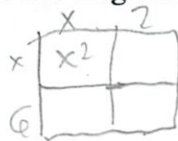


Name M. hood/plasmpa
 Period 2 B
 Date 6 Oct 2005

A Lot of Changing Sides Revisited

Directions: The developer from A Lot of Changing Sides has taken to writing plans for lot sizes in algebraic code. Unfortunately, the codes are giving the city planner a hard time. Help the city planner by finding out what the developer planned to do with the original square lot. Remember that the original lot had sides of length x .

1. $x^2 + 2x + 6x + 12 =$



Extend side by "2" and other by "6"
 $(x+6)(x+2)$

2. $x^2 + 8x + 2x + 16 =$



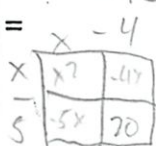
Extend side by "8" and other by "2"
 $(x+8)(x+2)$

3. $x^2 - 7x + 3x - 21 =$



Extend side by 3, shrink other by 7
 $(x+3)(x-7)$

4. $x^2 - 4x - 5x + 20 =$



Shrink side by 4 and other by 5
 $(x-4)(x-5)$

The developer's plan became more complex. Figure out what each entry means. (What was done to the original lot?)

5. $x^2 + 9x + 14 =$



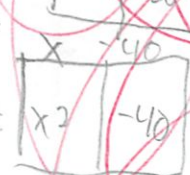
Extend side by 9, other by 1.55

6. $x^2 - 7x - 30 =$



Extend side by 4.28, shrink other by 7

7. $x^2 + 8x - 48 =$



Shrink side by 48

8. $x^2 - 25 =$



Shrink side by 25

See attached sheet

Factoring Out harder

Determine the Factors that were multiplied together to get this equation

Ex: $x^2 + 9x + 20$ what 2 # are x to get 20

And Add together to get a min

Answer $(x+4)(x+5)$ can check w/ 3 method

Ex2 $x^2 + 8x + 7$ multiply to get this

↑
Add to get this } Answer

$(x+7)(x+1)$

Ex3

$x^2 + 2x - 24$

sign goes w/ larger #
 $(x-4)(x+6)$

} get answer by
guess + check
* look at factor (s)

I was wrong need to do problem like this

5. $x^2 + 9x + 14$ multiply to this
Add for this

(1) Check factor list for 14 : 1, 2, 7, 14

(2) Everything positive so Add for 9
 $(x+7)(x+2)$

(3) Check: $x(x) \quad x(2) \quad 7x \quad 7(2)$
 $x^2 + 2x + 7x + 14$
 $x^2 + 9x + 14$
✓

6. $x^2 - 7x - 30$ Bigger #
3 and -10
 $(x+3)(x-10)$

7. $x^2 + 8 - 48$
 $(x+12)(x-4)$ Guess + Check

8. $x^2 - 25$
Difference of Squares $(x+5)(x-5)$

Distributive Property

$$a(x+y) = a(x) + a(y)$$

$$a \begin{bmatrix} x+y \\ a(x) \quad a(y) \end{bmatrix} = a(x) + a(y)$$

Factoring vs. Multiplying

- going from $a(x) + a(y)$ to $a(x+y)$ is Factoring. You are factoring out (taking away) a common term
- going from $a(x+y)$ to $a(x) + a(y)$ is Multiplying. You are multiplying through (expanding)

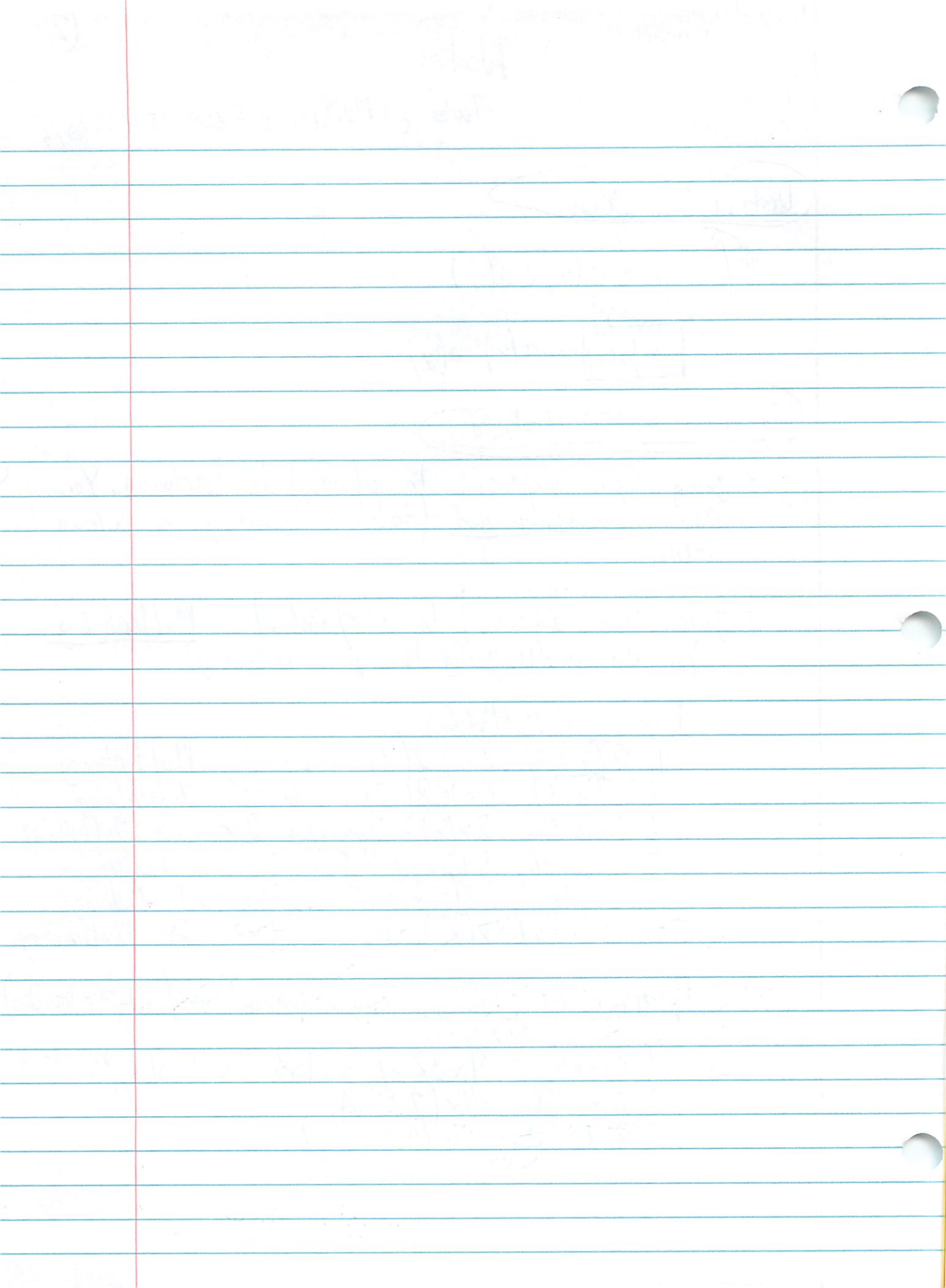
Example of Multiplying

1. $2(x+4)$ $2x + 2(4)$ or $2x + 8$ - Multiplying
2. $3(x-5)$ $3x + 3(-5)$ or $3x - 15$ - Multiplying
3. $2x(x+3)$ $2x(x) + 2x(3)$ or $2x^2 + 6x$ - Multiplying
4. $4(2x+6)$ $4(2x) + 4(6)$ or $8x + 24$ - Multiplying
5. $3(-2x+7)$ $3(-2x) + 3(7)$ or $-6x + 21$ - Multiplying
6. $-x(x^2-5)$ $-x(x^2) + (-x)(-5)$ or $-x^3 + 5x$ - Multiplying

Examples of Factoring - largest common terms (whole # + variables)

Factoring of 3

1. $3x + 6y = 3(x+2y)$ to check $3x + 3(2y)$
2. $8x + 36xy = 4x(2+9y)$
3. $321v - 11vy = v(321 - 11y)$



Notes p2

Expressions Multiplication

- binomial = an expression w/ 2 terms Ex: $x+4$

- trinomial = an expression w/ 3 terms Ex: x^2+3x+5

* 3 different ways to multiply

1. Box method

ex: $(x+6)(x+8)$

$$x^2 + 6x + 8x + 48$$

$$x^2 + 14x + 48$$

	x	6
x	x^2	$6x$
8	$8x$	48

ex: $3x(2x-7)$

$$6x^2 - 21x$$

	$2x$	-7
$3x$	$6x^2$	$-21x$

2. Vertical Multiplication

52

$$\begin{array}{r} \times 13 \\ 156 \\ + 520 \\ \hline \end{array}$$

Normal way of multiplying + is the same w/ algebraic

①

$$\begin{array}{r} x-3 \\ \times x+3 \\ \hline 3x-9 \\ x^2-3x+0 \\ \hline x^2+0-9 \\ x^2-9 \end{array}$$

$$\begin{array}{r} x+7 \\ \times x+2 \\ \hline 2x+14 \\ x^2+7x+0 \\ \hline x^2+9x+14 \end{array}$$

$$\begin{array}{r} 2x+3 \\ \times x+4 \\ \hline 8x+12 \\ 2x^2+3x+0 \\ \hline 2x^2+11x+12 \end{array}$$

$$\begin{array}{r} 4x+x+3 \\ \times 4x+x+3 \\ \hline -4x+x+32 \\ -4x+x+32 \\ \hline x^2+8x+0 \\ x^2+12x-32 \end{array}$$

Difference of squares

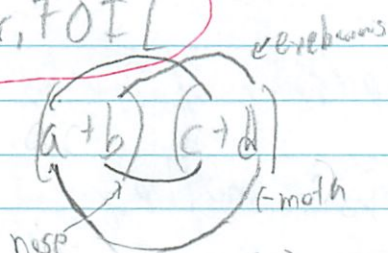
If you have $x^2 - 25 = (x-5)(x+5)$
Square

Mr. Foil on the back

Notes p3 p3

Mr. Foil

#3 Mr. FOIL



$$a(c) + b(d) + b(c) + a(d)$$

F = First Terms a and c

O = Outer a and d

I = Inner b and c

L = Last b and d

Ex $(x+7)(x-3)$

$$x(x) + x(-3) + 7(x) + 7(-3)$$

$$x^2 - 3x + 7x - 21$$

$$x^2 + 4x - 21$$

Ex 2 $(x+5)(x-4)$ or $x(x) + x(-4) + x(5) + 5(-4)$

$$x^2 - 4x + 5x - 20$$

$$x^2 + x - 20$$

Ex 3 $(x+3)(x-4)$ or $x(x) + x(-4) + 3(x) + 3(-4)$

$$x^2 - 4x + 3x - 12$$

$$x^2 - x - 12$$

See also Harder Factoring
Back of p19

Like
Using BoF

F	I
O	L

Michael Plasmeyer
Bohl
TAG 2/49
6 Oct 2005

Distribute 7 lots (#15)

(21)

10/6

1. a $4(a+8) = 4a + 36$

b $3(5w+2r) = 3(5w) + 3(2r) = 15w + 6r$

c $6t(2+3s) = (6t)2 + (6t)3s = 12t + 18ts$

d $10c(u+v+w) = 10c(u) + 10c(v) + 10c(w) \rightarrow 10cu + 10cv + 10cw$

2. a $14d + 21e = 7(2d + 3e)$

b $rg + rh = r(g+h)$

c $2pq + 4pr = 2p(q+2r)$ check: $2p(a) + 2p(2r) = 2pq + 4pr$

d $6ab + 10ac = 2a(3b + 5c)$

Part 2 ~~2~~ • Extend 1 side by 3 the other by 5

4a

"

4

6

4b

"

6

2

$$\begin{pmatrix} x+3 \\ x+4 \\ x+6 \end{pmatrix} \begin{pmatrix} x+5 \\ x+6 \\ x+2 \end{pmatrix}$$

5. a $x^2 + 9x + 18 = (x+3)(x+6)$

b $x^2 + 6x + 8 = (x+2)(x+4)$ $\uparrow$ Because they are both positive

c $x^2 + 7x + 10 = (x+2)(x+5)$ $\uparrow$ both things are positive

d $x^2 + 5x + 4 = (x+1)(x+4)$

$\downarrow$ $\downarrow$
add to this multiply to this

(31) 4/11/11
(32) 4/11/11
(33) 4/11/11

Name Michael Hasler
 Period 2B
 Date 10/10/05

Box Method and Distribute Review

Directions: Find an equivalent expression without parentheses for each of the following expressions, using the box method.

1. $(x+9)(x+4) =$

x	x^2	$9x$
$+4$	$4x$	36

$$x^2 + 13x + 36$$

Box

2. $(x-7)(x-3) =$

$$\begin{array}{r} x-7 \\ x-3 \\ \hline \end{array}$$

$$-3x - 21$$

$$x^2 - 7x + 0$$

$$x^2 - 10x - 21$$

3 methods

Vertical Multiplication

Foil

3. $(x)(x+8) =$

$$(x+0)(x+8)$$

$$x(x) + x(8) + 0(x) + 0(8)$$

$$x^2 + 8x + 0 + 0$$

4. $(3x)(x - 5) =$

	$3x$	$\times$	0
x	$3x^2$		0
-5	$-15x$		0

$3x^2 - 15x$

5. $(2x + 1)(x - 6) =$

	$2x$	$+1$	
x	$2x^2$	$1x$	
-6	$-12x$	-6	

$2x^2 - 11x - 6$

Directions: Use the distributive property to find an equivalent expression for each problem below.

6. $7(x + 6) = 7(x) + 7(6) \rightarrow 7x + 42$

7. $5(x - 8) = 5(x) + 5(-8) \rightarrow 5x - 40$

8. $2x(x + 4) = 2x(x) + 2x(4) \rightarrow 2x^2 + 8x$

9. $3x(3x - 5) = 3x(3x) + 3x(-5) \rightarrow 9x^2 - 15x$

10. $4(5x - 7) = 4(5x) + 4(-7) \rightarrow 20x - 28$

Directions: For each of the following problems, take out a common factor.

11. $21x + 35 = 7(3x + 5)$

doesn't need to be largest,
can factor out anything

12. $re + rd = r(e + d)$

can't $x/5 \Rightarrow (5x)$

13. $2x + 3x = x(2 + 3)$

Be sure to

14. $18 + 54x = 9(2 + 6x)$ check $9(2) + 9(6x) = 18 + 54x$ ✓

15. $8xy + 10xz = 2x(4y + 5z)$

what you are
taking out

then take it out to get this

Michael Placides
Behl
JAG2H9
10 Oct 2005

Subtracting Sums (18)

(23)

Skill

1a. $35 - (3a + 14)$

$$35 - (3a) + 35 - (14)$$

$$35 - 3a - 14$$

Subtraction
Distributive

b $50 - (c + 17 + 2d)$

$$50 - c - 17 - 2d$$

$$33 - c - 2d$$

1c $16 + 9s - (3s + 11)$

$$16 + 9s - 3s - 11$$

subtract not multiply
10/10

1d $23 + 5w - 2(w + 7)$

$$23 + 5w - 2w - 14$$

$$9 + 3w$$

multiply

My exploration

$$\begin{array}{r} 5 - (3 + 7) \\ 5 - 3 - 7 \\ -5 \end{array}$$

(part to)

$$\begin{array}{r} (5 - 3) - (5 - 7) \\ 2 - 2 \\ 0 \end{array}$$

$$\begin{array}{r} 5 - 10 \\ -5 \end{array}$$

Also like this:

$$\begin{array}{r} 5 - (3 + 7) \\ 5 + (-3) + (-7) \\ 5 - 3 - 7 \\ -5 \end{array}$$

When you have these w/ the sign

2a $54 - (1 + 5) = 32$

$$54 - 1 - 5 = 32$$

$$54 - 1 = 37$$

$$37 - 5 = 32$$

$$37 - 5 = 32$$

$$32 = 32$$

$$1 = 17$$

get rid of parentheses (distribute) 1st, then Solve

b $29 - 2(x + 4) = 5$

$$29 - 2x - 8 = 5$$

$$21 - 2x = 5$$

$$-2x = -16$$

$$-2x = -16$$

$$-2x = -16$$

$$x = 8$$

Subtraction
Distributive +
Solve for
Equation

variable must be positive

Continued

Skill

2c: $62 + 17 - (22 + 5) = 56$
 $62 + 17 - 22 - 5 = 56$
 $42 + 17 = 56$
 $\begin{array}{r} 42 \\ -12 \\ \hline 30 \end{array}$
 $\begin{array}{r} 30 \\ -12 \\ \hline 18 \end{array}$
 $\begin{array}{r} 18 \\ -7 \\ \hline 11 \end{array}$
 $\Sigma = 11$

3a $(x+4)(x+7) = x(x) + x(7) + 4(x) + 4(7)$
 $x^2 + 7x + 4x + 28$

Foil

b $(2+3)(3+5) = x^2 + 11x + 28$

Distributive Property

	2+3	
3	6+9	15
5	10+15	25

$6+9+10+15$

Box

$(6+9+10+15)$

c $(4r-3)(3r-2) = 4r(3r) + 4r(-2) + -3(3r) + -3(-2)$

d $(x^2+3x+2)(x+6)$
 $x^2 + 3x + 2$

$12r^2 - 8r - 9r + 6$

$(12r^2 - 17r + 6)$

Foil

x	x^3	$3x^2$	$2x$
+			
6	$6x^2$	$18x$	12

$x^3 + 3x^2 + 2x + 6x^2 + 18x + 12$

$(x^3 + 9x^2 + 20x + 12)$

Box

4a $26m + 37 = 11m + 58$
 $\begin{array}{r} 26m \\ -11m \\ \hline 15m \end{array}$
 $\begin{array}{r} 37 \\ -58 \\ \hline -21 \end{array}$

$26m = 11m + 21$

$\begin{array}{r} 26m \\ -11m \\ \hline 15m \end{array}$

$15m = 21$

$\begin{array}{r} 15m \\ -21 \\ \hline 3m \end{array}$

$m = 3$

Solve for variable

b $46a + 15 = 83a + 29$
 $\begin{array}{r} 46a \\ -83a \\ \hline -37a \end{array}$
 $\begin{array}{r} 15 \\ -29 \\ \hline -14 \end{array}$

$46a = 83a + 29$

$\begin{array}{r} 46a \\ -83a \\ \hline -37a \end{array}$

$15 = 83a + 29$

$\begin{array}{r} 15 \\ -29 \\ \hline -14 \end{array}$

$66 = 37a$
 $\begin{array}{r} 66 \\ -37 \\ \hline 29 \end{array}$
 $1.78 = a$

c $153x + 149 = 327x + 73$
 $\begin{array}{r} 153x \\ -327x \\ \hline -174x \end{array}$
 $\begin{array}{r} 149 \\ -73 \\ \hline 76 \end{array}$

$153x + 76 = 327x$

$\begin{array}{r} 153x \\ -327x \\ \hline -174x \end{array}$

$76 = 174x$

$\begin{array}{r} 76 \\ 174 \\ \hline 436 \end{array}$

$436 = x$

Michael Macneil
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10 Oct 2005

Equation Time (20)

(24)

10/10

1, Nope - When he multiplied both sides by 2 he'd should also multiply 11 by 2. It does not matter that the 1.5 has a variable (or he could not multiply 1.5 and not cause confusion)

* When you multiply both sides, multiply everything including the variable
Ex $2x + 4 = 12$
 $\times 2$
 $4x + 8 = 24$

$$1.5x + 4 = 11$$

$$\times 2 \quad \times 2 \quad \times 2$$

$$3x + 8 = 22$$

$$-8 \quad -8$$

$$3x = 14$$

$$\frac{3}{3} \quad \frac{14}{3}$$

$$x = 4\frac{2}{3}$$

$$1.5x + 4 = 11$$

$$-4 \quad -4$$

$$1.5x = 7$$

$$\frac{1.5}{1.5} \quad \frac{7}{1.5}$$

$$x = 4\frac{2}{3}$$

2(1.5x + 4) (11) 2 write like this + cross x to remember

2a $\frac{x}{5} = \frac{x+2}{8}$ is the same as $\frac{x}{5} = \frac{(x+2)}{8}$

~~(cross multiply)~~
 $5(x+2) = 8x$

$$5x + 10 = 8x$$

$$-5x \quad -5x$$

$$10 = 3x$$

$$\frac{3}{3} \quad \frac{10}{3}$$

$$3\frac{1}{3} = x$$

$$3\frac{1}{3} = x$$

check

$$5(3\frac{1}{3} + 2) = 8(3\frac{1}{3})$$

$$5(6\frac{2}{3}) = 8(3\frac{1}{3})$$

$$26\frac{2}{3} = 26\frac{2}{3}$$

(✓) cross x worked

see

Don't - wrong suppose to cross multiply
Do $x = (5x + 10) / 48$

$$\times 8$$

$$\times 8$$

$$8x = (10x + 80) / 320$$

$$8x = .125x + .25$$

$$-.125x \quad -.125x$$

$$7\frac{3}{8}x = .25$$

$$\frac{7.875}{7.875} \quad \frac{.25}{7.875}$$

That is how x sides by 40

$$\frac{40}{5}x = \frac{40 \times .25}{5}$$

Then solve for x

$$x = 0.31 \text{ can't be right}$$

were we suppose to

(cross multiply 7)

(yes)

3 On back

$$3a \quad 41 + 7d - 5(d + 7) = 8d + 1$$

$$41 + 7d - 5d - 35 = 8d + 1$$

$$6 + 2d = 8d + 1$$

$$5 + 7d = 8d$$

$$\frac{5}{6} = \frac{6d}{6} = d$$

$$d = .833$$

1. 100%
2. 100%
3. 100%
4. 100%
5. 100%
6. 100%
7. 100%
8. 100%
9. 100%
10. 100%

Didn't copy

$$8w = -3(2w - 9) = 7w + 14$$

$$b \quad 8w - 3(2w) + (-3)(-9) = 7w + 14$$

$$8w - 6w + 27 = 7w + 14$$

$$2w + 27 = 7w + 14$$

$$27 = 5w + 14$$

$$\frac{13}{5} = \frac{5w}{5}$$

$$(2.6 = w)$$

↑ copy error
Calc

Michael Plasmier
 Behl
 14.2.94
 12.04.2005

Matt Fav' Bags (26)

10/12

(26)

1.

$$x = 3$$

$$x - 5 = -2$$

- subtract 5

$$10(x - 5) = -20$$

x16

- times 10
 - divide by 4

$$10(x - 5) = -5$$

$$-20 = -5$$

$$10(-2) = -5$$

$$10((3) - 5) = -5$$

2

$$3x - 5 = -2$$

$$3x = 3$$

$$x = 1$$

$$3(1) - 5 = -2$$

$$3 - 5 = -2$$

3.

$$x - 6 + 1 = 7$$

$$x - 6 = 6$$

$$x = 12$$

$$9 + 6$$

$$15 = 9 + 6$$

Back

4

$$7 = 7$$

$$6 + 1 = 7$$

$$7 = 1 + \frac{6}{24}$$

$$7 = 1 + \frac{6}{(36) - 6}$$

$$4. \quad 4\left(\frac{x}{3} + 6\right) - 8 = 20$$

$$4\left(\frac{x}{3} + 6\right) - 8 = 20$$

$$4\left(\frac{x}{3} + 6\right) - 8 = 20$$

$$4\left(\frac{x}{3} + 6\right) - 8 = 20$$

$$4\left(\frac{x}{3} + 6\right) - 8 = 20$$

$$\frac{x}{3} = 1$$

$$\times 3 \times 3$$

$$x = 3$$

$$4\left(\frac{3}{3} + 6\right) - 8 = 20$$

$$4(6) - 8 = 20$$

$$24 - 8 = 20$$

$$16 \neq 20$$

$$\otimes$$

$$28 - 8 = 20$$

$$\odot$$

Part 2

$$5. \quad 11t + 13 = 7t + 41$$

$$11t = 7t + 28$$

$$\frac{4t}{4} = \frac{28}{4}$$

$$t = 7$$

$$6. \quad 12 + 7w = 4w + 21$$

$$12 + 3w = 21$$

$$\frac{3w}{3} = \frac{9}{3}$$

$$w = 3$$

$$7. \quad 8(x + 13) + 14 = 15 + 2(x + 35)$$

$$8(x + 13) + 14 = 15 + 2(x + 35)$$

$$8x + 24 + 14 = 15 + 2x + 70$$

$$6x + 43 = 85$$

$$6x = 42$$

$$x = 7$$

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17 Oct 2005

New Friends Visit (22)

(27)

10/17

1. $7x - 5 = 10x + 8 - 4x$ ✓ $7(13) - 5 = 10(13) + 8 - 4(13)$

$$7x - 5 = 6x + 8$$

$$\begin{array}{r} +5 \\ +5 \end{array}$$

$$7x = 13 + 6x$$

$$\begin{array}{r} -6x \\ -6x \end{array}$$

$$x = 13$$

$$91 - 5 = 130 + 8 - 52$$

$$86 = 138 - 52$$

$$86 = 86$$

✓

2. $6(x+2) = 4(x+3) - 32$ ✓ $6(-4+2) = 4(-4+3) - 32$

$$6x - 12 = 4x + 12 - 32$$

$$\begin{array}{r} -4x \\ -4x \end{array}$$

$$2x - 12 = -20$$

$$\begin{array}{r} +12 \\ +12 \end{array}$$

$$2x = -8$$

$$\frac{2x}{2} = \frac{-8}{2}$$

$$x = -4$$

$$6(-6) = 4(-1) - 32$$

$$-36 = -4 - 32$$

$$-36 = -36$$

✓

3. $8r + 1 = 12r + 27$

$$\begin{array}{r} -8r \\ -8r \end{array}$$

$$1 = 4r + 27$$

$$\begin{array}{r} -27 \\ -27 \end{array}$$

$$-26 = 4r$$

$$\frac{-26}{4} = \frac{4r}{4}$$

$$-6.5 = r$$

$$-52 + 1 = -78 + 27$$

$$-51 = -51$$

✓

$$4 \quad 5(w+4) - 3(w+2) = 3(w+3) - (w-5)$$

$$5w + 20 - 3w - 6 = 3w + 9 - w + 5$$

$$2w + 14 = 2w + 14$$

Can't solve - both sides =, ~~w~~ can be any #

$$5 \quad 6g - (3g + 8) = 16 \quad \checkmark: 6(8) - (3(8) + 8) = 16$$

$$6g - 3g - 8 = 16$$

$$3g - 8 = 16$$

$$\frac{3g}{3} = \frac{24}{3}$$

$$g = 8$$

$$48 - (24 + 8) = 16$$

$$48 - 32 = 16$$

$$16 = 16$$

✓

$$6 \quad 7 - 4d = 3d - 9d + 25$$

$$7 - 4d = -6d + 25$$

$$+6d \quad +6d$$

$$7 + 2d = 25$$

$$-7 \quad -7$$

$$2d = 18$$

$$\frac{2d}{2} = \frac{18}{2}$$

$$d = 9$$

$$\checkmark: 7 - 4(9) = 3(9) - 9(9) + 25$$

$$7 - 36 = 27 - 81 + 25$$

$$-29 = -54 + 25$$

$$-29 = -29$$

✓

$$\checkmark: 6 + 4(-2 + 2) = 10 - 4(-2)$$

$$6 + 4(0) = 10 + 8$$

$$6 = 18$$

✗ wrong

$$7 \quad 6 + 4(x+2) = 10 - 4x$$

$$6 + 4x + 8 = 10 - 4x$$

$$14 + 4x = 10 - 4x$$

$$-10 \quad -10$$

$$4 + 4x = -4$$

$$-4x \quad -4x$$

$$4 = -8 \quad (-1)$$

$$\text{Aggini: } 6 + 4(-.5 + 2) = 10 - 4(-.5)$$

$$6 + 4(1.5) = 10 + 2$$

$$6 + 6 = 12$$

$$12 = 12$$

✓

$$-4 = 8$$

$$\frac{-4}{-2} = \frac{8}{-2}$$

$$-2 = -2$$

$$-1.5 = x$$

must divide by the #

Michael Plasmeier
Behl
IAG2HL
17 Oct 2008

1 Variable $\rightarrow 2(23)$

(28)

1. $y = 2x + 3$

x	y
-2	1
-1	1
0	3
1	5
2	7
3	9
4	11

2. $x + 2y = 5 + 3x + y$
 $-2 + 2y = 5 + 3(-2) + y$
 $2y - 2 = 5 - 6 + y$
 $2y - 2 = -1 + y$
 $y - 2 = -1$
 $y = 1$

10/17

x	y
-2	1
-1	3
0	5
1	7
2	9
3	11
4	13

3. $x + 2y = 5 + 3x + y$
 $-x \quad -y$
 $x + y = 5 + 3x$
 $-x \quad -x$
 $y = 5 + 2x$

more practice: Solve for x in terms of y

$5x + 4 - 2y = 7x + 5 + 4y$
 $+2y \quad +2y$

$5x + 4 = 7x + 5 + 6y$
 $-4 \quad -4$

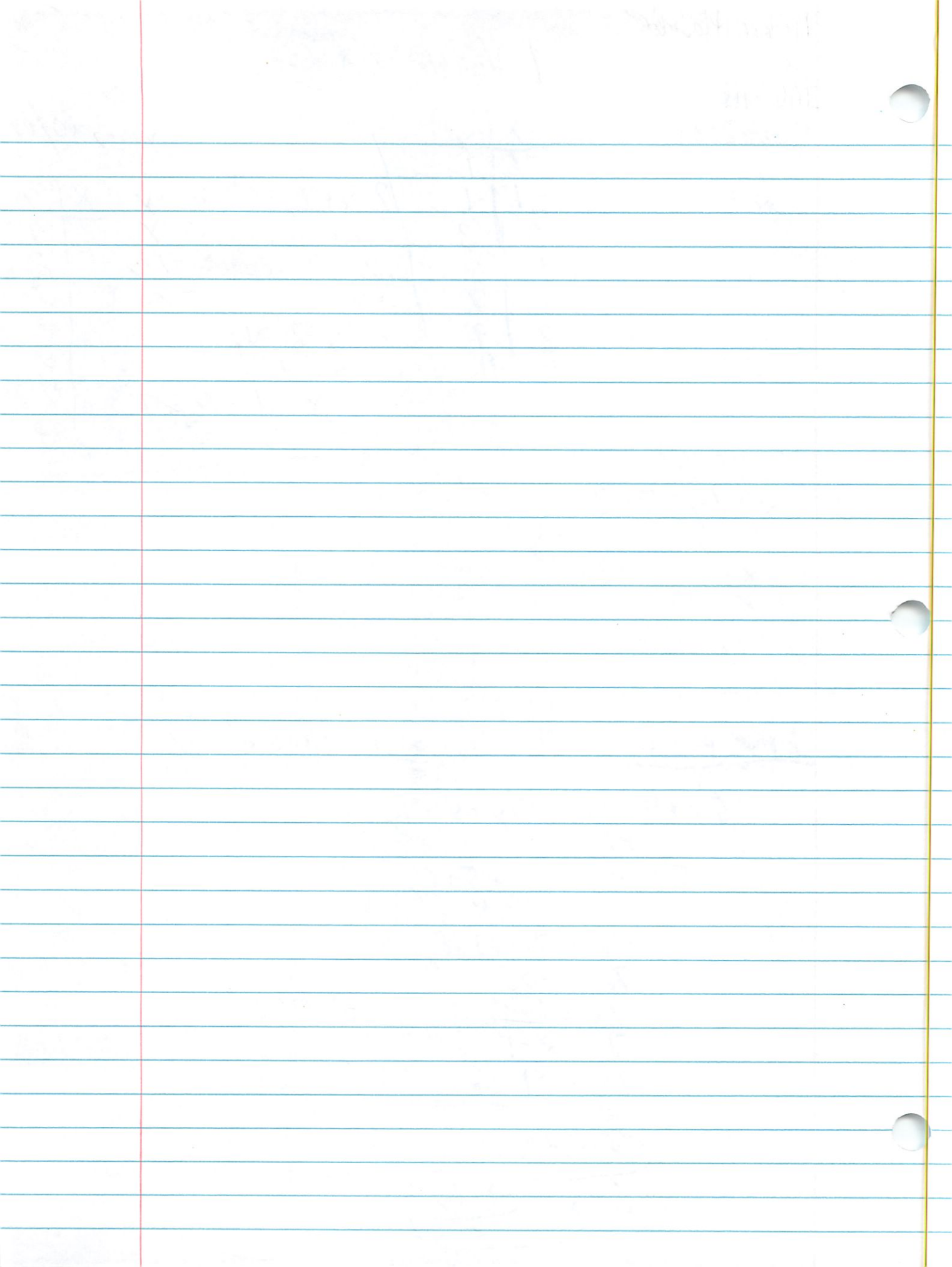
$5x = 7x + 1 + 6y$

$-2x = 1 + 6y$
 $-2x \quad -2x$
 $x = -\frac{1}{2} - 3y$

$2x = -1 - 6y$

$x = -\frac{1}{2} - 3y$

or $x = \frac{-1 - 6y}{2}$



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17 Oct 2005

All by Itself (25)

(29)

10/17

1. $3B + 26 = 10$ Solve for B in terms of 6

$$\begin{array}{r} -26 \quad -26 \\ 3B = 10 - 26 \\ 3 \quad 3 \end{array}$$

$$B = \frac{10 - 26}{3}$$

Don't have to
simplify further, this
is fine.

2. $2v + 7 = w - 3$ Solve v in terms of w

$$\begin{array}{r} -7 \quad -7 \\ 2v = w - 10 \\ 2 \quad 2 \end{array}$$

$$v = \frac{w - 10}{2}$$

6. $4r + 5s + 2 = 8r - s + 7$ Solve for s in terms of r

$$\begin{array}{r} -4r \quad -4r \\ 5s + 2 = 4r - s + 7 \\ -2 \quad -2 \end{array}$$

$$\begin{array}{r} 5s = 4r - s + 5 \\ +s \quad +s \end{array}$$

$$6s = 4r + 5$$

$$s = \frac{4r + 5}{6}$$

C: $5y - 2x + 1 = 3(y + x) - (x - 5)$ Solve y in terms of x

$$5y - 2x + 1 = 3y + 3x - x + 5$$

$$\begin{array}{r} +2y \quad +2x \\ 5y + 1 = 3y + 2x + 5 \end{array}$$

Don't forget this
⊖ It's subtraction

$$5y = 3y + 2x + 4$$

$$\begin{array}{r} -3y \quad -3y \\ 2y = 2x + 4 \end{array}$$

$$\frac{2y}{2} = \frac{2x + 4}{2}$$

$$y = \frac{2x + 4}{2}$$

$$y = \frac{2x + 4}{2} \text{ or } y = 2x + 2$$

d. $4r + 5s + 2 = 8r - s + 7$ Solve R in terms of S

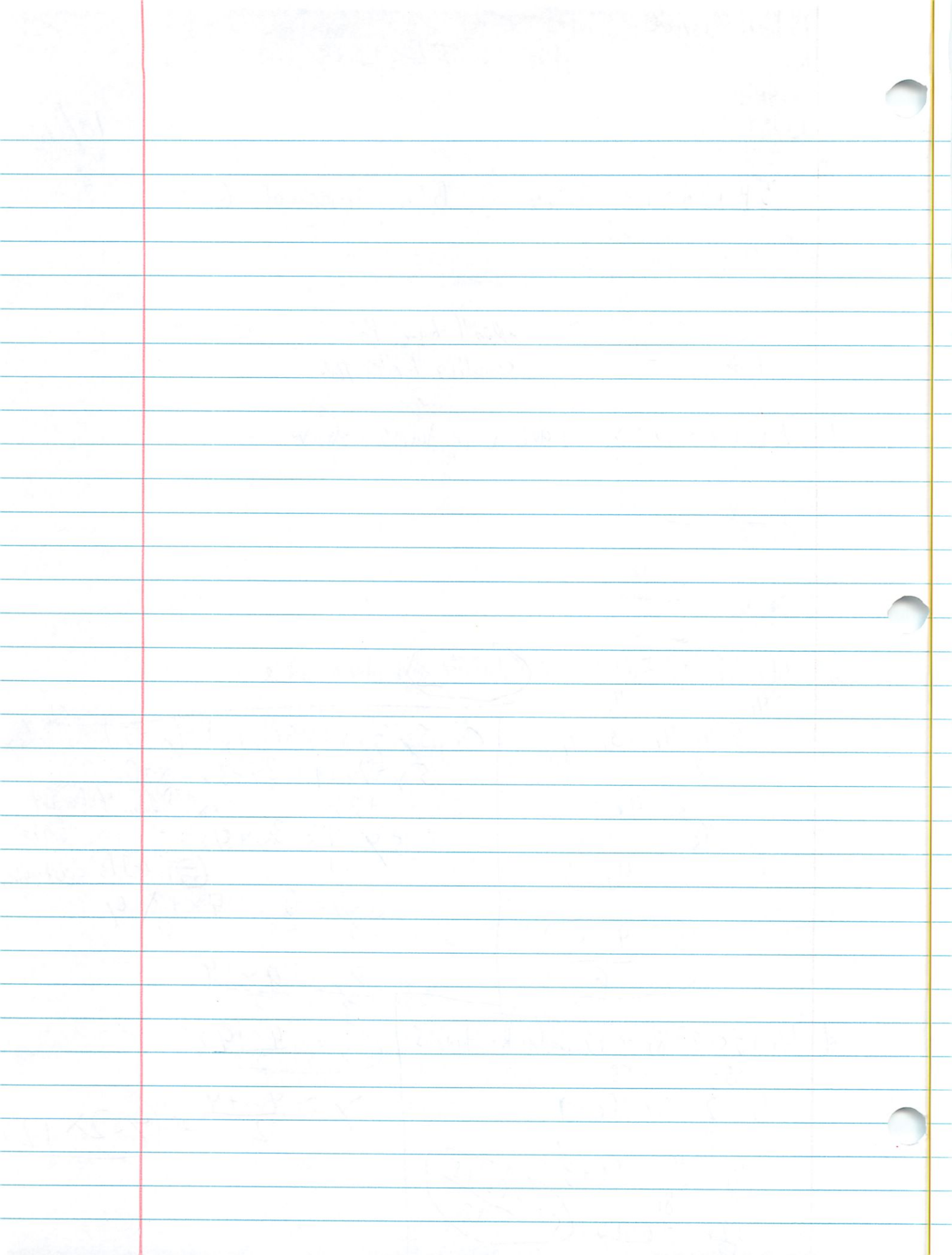
$$\begin{array}{r} -5s \quad -5s \\ 4r + 2 = 8r - 6s + 7 \\ -2 \quad -2 \end{array}$$

$$4r = 8r - 6s + 5$$

$$\begin{array}{r} -8r \quad -8r \\ -4r = -6s + 5 \end{array}$$

$$\frac{12r}{12} = \frac{-6s + 5}{12}$$

$$r = \frac{-6s + 5}{12}$$



2 Variable Solving Equations Review

Name Michael Plummer
Period 2nd
Date 10/12/05

1. Solve this equation for y in terms of x.

$$6x + 4 + 2y = 3y + 4x + 10$$

$$\begin{array}{r} 6x + 4 - 4 - y = 4x + 10 - 3y - 2y \\ -y = 4x + 10 - 3y - 2y \end{array}$$

$$\begin{array}{r} 6x - y = 4x + 10 \\ -6x - y = -6x - 4x - 10 \end{array}$$

$$-y = -2x + 6$$

$$y = 2x - 6$$

I would it be - or positive

2. Solve this equation for b in terms of c.

$$7b + 3 - 5c = 8b - 2 - 10c$$

$$\begin{array}{r} 7b + 3 - 5c = 8b - 2 - 10c \\ -8b \end{array}$$

$$\begin{array}{r} -b + 3 - 5c = -2 - 10c \\ +5c \end{array}$$

$$\begin{array}{r} -b + 3 = -2 - 5c \\ -3 \end{array}$$

$$\begin{array}{r} -b = -5 - 5c \\ \times -1 \end{array}$$

$$b = 5 + 5c$$

(or)

$$b = 5c + 5$$

3. Solve this equation for f in terms of g.

$$3g + 4 + 10f = 9g - 6 + 12f$$

$$\begin{array}{r} 3g + 4 - 3g - 2f = 9g - 6 - 3g - 2f \\ -2f = 6g - 10 \end{array}$$

$$\begin{array}{r} 4 - 2f = 6g - 6 \\ -4 \end{array}$$

$$\begin{array}{r} -2f = 6g - 10 \\ -2 \end{array}$$

$$f = \frac{6g - 10}{-2}$$

$$\begin{array}{l} f = 5 - 3g \\ f = \frac{-6g + 10}{2} \end{array}$$

$$\text{Also Correct } \frac{10 - 6g}{2} = f$$

4. Solve this equation for m in terms of p.

$$-8m - 6 - 2p = -9m + 4 + 6p$$

$$\begin{array}{r} -8m - 6 - 2p = -9m + 4 + 6p \\ +9m \end{array}$$

$$\begin{array}{r} m - 6 - 2p = 4 + 6p \\ +6 \end{array}$$

$$\begin{array}{r} m - 2p = 10 + 6p \\ +2p \end{array}$$

$$m = 10 + 8p \quad (\text{or}) \quad m = 8p + 10$$

Michael Plagner
Behl
IAG 2 H9
19 Oct 2005

Mixed Bag (27)

(31)

10/19

$$1. \quad 5a + 3 = 7a - 9$$

$$\begin{array}{r} 5a + 12 = 7a \\ -5a \quad -5a \end{array}$$

$$\frac{12}{2} = \frac{2a}{2}$$

$$6 = a$$

Solve for r in terms of v

$$2. \quad 8v + 5r - 14 = 0$$

$$\begin{array}{r} 5r - 14 = -8v \\ +14 \quad +14 \end{array}$$

$$\frac{5r}{5} = \frac{-8v + 14}{5}$$

$$r = \frac{-8v + 14}{5}$$

$$1b. \quad 4(t+7) - 2(t-3) = 8t + 11$$

$$\begin{array}{r} 4t + 28 - 2t + 6 = 8t + 11 \\ 2t + 34 = 8t + 11 \\ -11 \quad -11 \end{array}$$

$$\begin{array}{r} 2t + 23 = 8t \\ -2t \quad -2t \end{array}$$

$$\frac{23}{6} = \frac{6t}{6}$$

$$\frac{23}{6} = t$$

Solve for

y in terms of a, b, c, x

$$2b. \quad ax + by = c$$

$$\begin{array}{r} by = c - ax \\ \frac{by}{b} = \frac{c - ax}{b} \end{array}$$

$$y = \frac{c - ax}{b}$$

Solve for m in terms of n

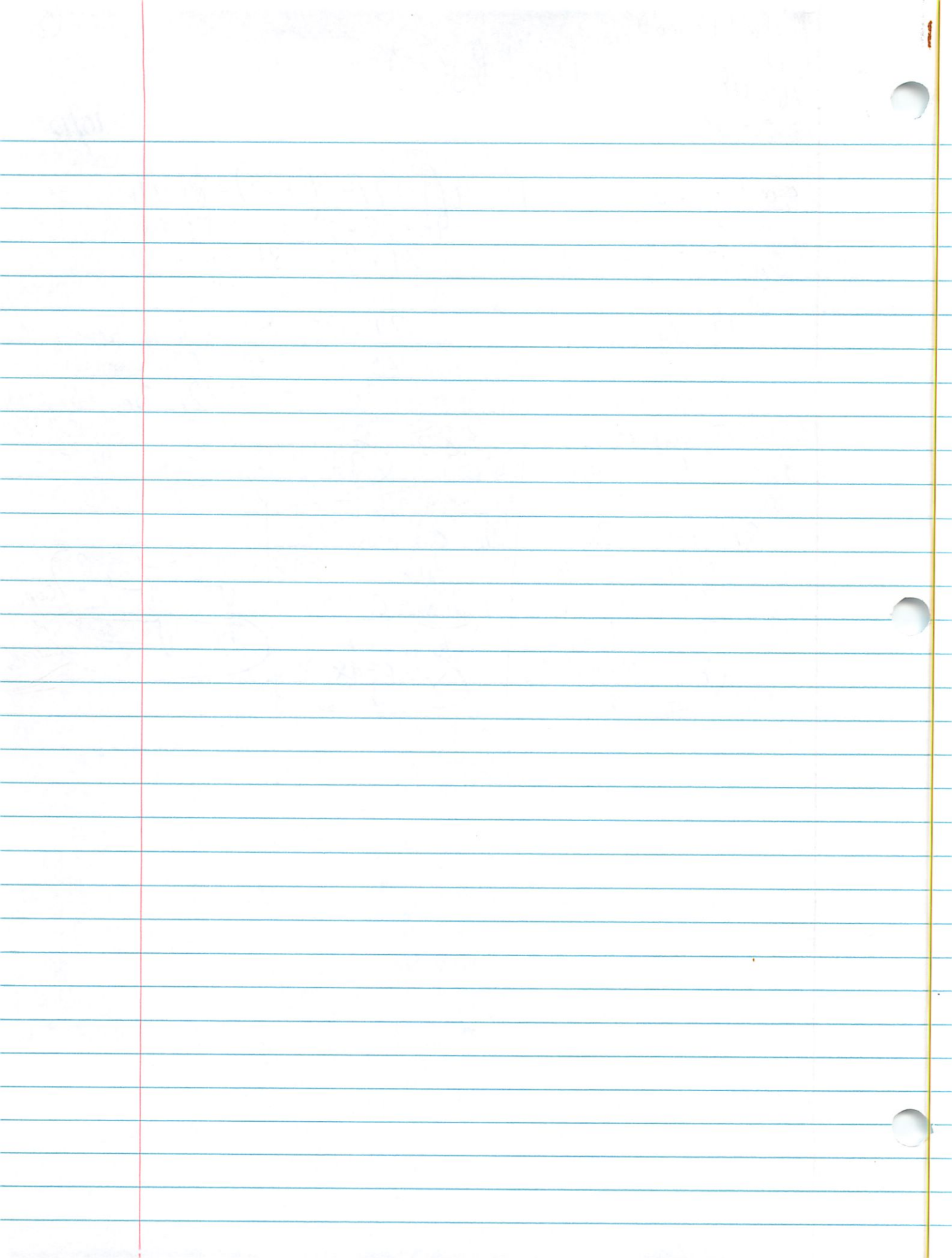
$$2c. \quad 3m^2 + 5n^2 = 21$$

$$\frac{3m^2}{3} = \frac{21 - 5n^2}{3}$$

$$m^2 = \frac{21 - 5n^2}{3}$$

$$m = \sqrt{\frac{21 - 5n^2}{3}}$$

copy it correctly



Name: Michael Plasio
 IAG 2
 Solve It

Date: 10/21

Equivalent Expressions

Directions: Please show all work that is necessary for each problem. Use any of the methods we have learned to find the equivalent expressions. Good Luck!

Use the distributive property to find an equivalent expression **without** parentheses.

1. $4a(3b - 4c)$

$4a(3b) + 4a(-4c)$
 $12ab - 16ac$ ✓ solve further

Answer: $12ab - 16ac$ ✓

2. $-3(x + 5y)$

$-3x + 3(5y)$
 $-3x - 15y$

Answer: $-3x - 15y$ ✓

3. $(x + 4)(x + 5)$

$x(x) + x(5) + 4(x) + 4(5)$

Answer: $x^2 + 9x + 20$ ✓

4. $(x + 1)(x + 7)$

$x(x) + x(7) + 1(x) + 1(7)$

Answer: $x^2 + 8x + 7$ ✓

5. $(x + 5)(x + 9)$

$x(x) + x(9) + 5(x) + 5(9)$

Answer: $x^2 + 14x + 45$ ✓

6. $(x - 2)(x + 3)$

$x(x) + x(3) - 2(x) - 6$

Answer: $x^2 + x - 6$ ✓

7. $(x - 6)(x - 4)$

$x(x) + x(-4) - 6(x) + 24$

Answer: $x^2 - 10x + 24$ ✓

$-6(-4) = +24$

make sure

8. $(3x + 3)(x + 2)$

$$3x(x) + 3x(2) + 3(x) + 3(2)$$

Answer: $3x^2 + 9x + 6$

9. $(2x - 2)(x - 4)$

$$2x(x) + 2x(-4) - 2(x) - 2(-4)$$

$+8$

Answer: $2x^2 - 10x + 8$

Find an equivalent expression for the following that do not have parentheses.

10. $4x - 5 - (2x + 6)$ *Must distribute*

$$4x - 5 - 2x - 6$$

$$2x - 11$$

Answer: $2x - 11$

11. $-4(2a - 3b) - (5b - 3a)$

$$-4(2a) - 4(-3b) - 5b - 3a$$

$$-8a + 12b - 5b + 3a$$

copy error *2 negs make a pos* *don't forget*

Answer: $-5a + 7b$
 $12b - 16a$

12. $(3x - 3) - 5(-2x - 4)$

$$3x - 3 - 5(-2x) - 5(-4)$$

$$3x - 3 + 10x + 20$$

Answer: $13x + 17$

Factor the following expressions.

13. $14xy - 35y$

Answer: $7y(2x - 5)$

14. $12ab - 20b + 44bc$

Answer: $4b(3a - 5 + 11c)$ *copy error*

15. $50c - 100a + 25ac$

Answer: $25(2c - 4a + ac)$

$$25(2c) + 25(-4a) + 25(ac)$$

$$50c - 100a + 25ac$$

16. $x^2 + 14x + 45$ ex to

add to $\uparrow$ $7 \times 7 = 49$ NOT 45

Answer: $\frac{(x+9)(x+5)}{(x+7)(x+7)}$

? difference of squares? No - must be $(a+b)(a-b)$

17. $x^2 + 6x + 9$

Answer: $\frac{(x+3)(x+3)}{(x+3)(x+3)}$

18. $x^2 - 12x - 220$

Answer: $\frac{(x-22)(x+10)}{(x-22)(x+10)}$

19. $x^2 + 2x - 24$

Answer: $\frac{(x-4)(x+6)}{(x-4)(x+6)}$

20. $x^2 - 36$

Answer: $\frac{(x-6)(x+6)}{(x-6)(x+6)}$

or is this difference of squares

yes - $(a+b)(a-b)$
diff of square $a^2 - b^2$

Name Michael Plasmea
 Behl
 IAG 2 - H
 November 4th, 2005

67
67



42

Solve - It Quiz

Directions: Use the distributive property to help you solve these equations.

1. $18 - (x + 2) = 21$

$$18 - x - 2 = 21$$

$$18 - x = 23$$

$$-18 -18$$

$$-x = 5$$

$x = -5$



2. $2(x + 3) - 5(x - 1) = -28$

$$2x + 6 - 5x + 5 = -28$$

$$2x - 5x = -39$$

$$-3x = -39$$

$x = 13$



Directions: Multiply these binomials to find an equivalent expression. Be sure to show all of your work.

3. $(x + 4)(x - 9)$

$$x(x) + x(-9) + 4(x) + 4(-9)$$

$$x^2 - 9x + 4x - 36$$

$$x^2 - 5x - 36$$



4. $(2x - 2)(x + 7)$

$$2x(x) + 2x(7) + -2(x) + -2(7)$$

$$2x^2 + 14x - 2x - 14$$

$$2x^2 + 12x - 14$$



5. $(x - 13)(x + 13)$

Difference of squares

$$x(x) + x(13) + -13(x) + -13(13)$$

$$x^2 + 13x - 13x - 169$$

$$x^2 - 169$$



Directions: Given these expressions determine what ^{two} factors were multiplied together in order to get them.

6. $x^2 - 14x + 48$

$(x-6)(x-8)$ ✓

7. $x^2 + 2x - 35$

$(x+7)(x-5)$ ✓

8. $x^2 - 289$

$(x+17)(x-17)$ ✓

Directions: Factor out the largest common term from these expressions.

9. $431x + 11xy$

$x(431 + 11y)$ ✓

10. $27bg - 36bu + 63bq$

$9b(3g - 4u + 7q)$ ✓

11. $10ms + 30mc + 50mhc + 70m^2w$

$10m(s + 3c + 5hc + 7mw)$ ✓

Directions: Use the distributive property to find an equivalent expression for each of these terms. Simplify the expressions to the lowest possible answer.

12. $-8x(x + 2) =$

$-8x^2 - 16x$ ✓

$2x + 7(x) + 7(1) - 4x$
 $9x + 7 - 4x$

Don't add to both sides.
Combine it

13. $2x + 7(x + 1) - 4x =$

$7x + 7$ ✓

$y = 5x + 7$

14. $-8 + 4x - (x + 5) =$

✓

$-8 + 4x - x - 5$
 $-13 + 3x$
 $y = 3x - 13$



Friday, October 21, 2005 12:02:57 PM

Message

From: "Vanessa Behl" <behl@havsd.net>

Subject:

To: Vanessa Behl

Michael

Solve-It Notebook Check IAG 2-H

1. Year 1 review
2. hmwk # 4
3. linear modeling wksheet
4. lamppost shadows
5. catching up
6. hmwk # 6
7. solving equation notes
8. hmwk # 7
9. hmwk # 8
10. hmwk # 9
11. back to the lake
12. solving equations wksheet
13. board problems
14. hmwk # 11
15. the graph solve the problem
16. a lot of changing sides
17. hmwk # 12
18. hmwk # 13
19. a lot of changing sides revisited
20. notes
21. hmwk # 15
22. box method and distributive review
23. hmwk # 18
24. hmwk # 20
25. scrambling equations (I HAVE)
26. hmwk # 21
27. hmwk # 22
28. hmwk # 23
29. hmwk # 25
30. solving equations review
31. hmwk # 27

Great job!

40/40

Vanessa Behl
Haverford High School
200 Mill Road
Havertown, PA 19083
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SOLVE IT

Michael Asmeia

PROMPT #1

An employee for a local store earns \$7.00 an hour for the first 40 hours he works in a week. If he works more than 40 hours in a week he gets time and a half for each hour over 40 hours. If his pay check last week was for \$332.50, how many hours over 40 did he work?

For full credit, you **must** do the following:

- Show or describe each step of your work, even if you did it in your head ("Mental Math"), or used a calculator.

AND

- Write an explanation stating the mathematical reasons **why** you chose each of your steps.

To solve the problem of how many hours overtime he worked, I first had to find out how much he was paid for overtime. To find this, I had to subtract his normal pay from the total. I found his normal pay by multiplying the hours he worked normally by the normal hour rate. ($7 \times 40 = \$280$ normal pay). I then subtracted this from his total pay ($\$332.50 - \$280 = \$52.50$ overtime pay). I now know that he made \$52.50 in overtime pay. To find the amount per hour overtime, I multiplied the normal rate times "a time and a half" or 1.5 ($7 \times 1.5 = 10.5$ per hr overtime pay). I now divided the total overtime pay by the hourly overtime rate. ($\$52.50 / 10.5 = 5$ hours) I now know that the employee worked 5 hrs over 40 hrs.

$$7 \times \$40 = \$280 \text{ normal}$$

$$\begin{array}{r} \$332.50 \text{ total} \\ - \$280 \text{ normal} \\ \hline \$52.50 \text{ overtime pay} \end{array} \div \begin{array}{r} 10.50 \\ (1.5 \times 7) \\ \uparrow \quad \uparrow \\ \text{time} \quad \text{normal} \\ \text{a half} \quad \text{pay} \end{array} = 5 \text{ hours worked overtime}$$

SCORE:



Solve It – Prompt #1

Problem statement?

To solve the problem of how many hours overtime he worked, I first had to find out how much he was paid for overtime. To find this, I had to subtract his normal pay from his total pay of \$332.50. I found his normal pay by multiplying the hours he normally works (40) by his normal hourly rate of \$7.00. ($\$7 \times 40 = \280 normal pay) I then subtracted this amount from his normal pay ($\$332.50 - \$280 = \$52.50$ overtime pay). I now know that he made \$52.50 in overtime pay. To find the amount per hour overtime, I multiplied the normal rate times “time and a half” of 1.5 ($\$7 \times 1.5 = \10.50 per hour overtime pay) I now divided the total overtime pay by the hourly rate ($\$52.50 / \$10.50 = 5$ hours) I now know that this employee worked 5 hours over his normal 40 hours a week.

$$\begin{aligned} & \$332.50_{total} \\ \$7 * 40_{hours} &= - \$280_{normal} \\ &= \$52.50_{overtime\ pay} / (1.5_{time\ and\ half} * \$7_{normal\ pay}) = 5_{hour\ overtime} \end{aligned}$$

This was an exceedingly easy and simple problem that could be both solved and explained in minutes. I would make it much, much more complicated before it was worthy of being called “like a POW”. I hope that future problem will be much, much harder to be worthy of being called a POW.

20/20

Scoring Rubric

Due 10/31/05
Monday

- Each prompt will be marked using the same scoring guidelines as the PSSA open-ended questions
- Each prompt will be scored on a 5 point rubric (0 through 4)
 - 4- The response demonstrates a thorough understanding of the mathematical concepts and procedures required by the task.
 - 3- The response demonstrates a general understanding of the mathematical concepts and procedures required by the task.
 - 2- The response demonstrates a partial understanding of the mathematical concepts and procedures required by the task.
 - 1- The response demonstrates a minimal understanding of the mathematical concepts and procedures required by the task.
 - 0- The response has no correct answer and insufficient evidence to demonstrate any understanding of the mathematical concepts and procedures as required by the task.
 - I- Illegible, or not turned in.
- Prompts will then be scaled to a 20 point value for use as a class assessment
- Scale will be
 - 4 equals 20 points
 - 3 equals 17 points
 - 2 equals 15 points
 - 1 equals 13 points
 - 0 equals 10 points
 - I equals 0 points is illegible or not turned in

NAME: _____

BLOCK: _____

BRAIN BUSTERS



Odd One Out

Which number on this square is the odd one out. Why?

3	33	15	36
12	27	34	18
72	39	30	6
24	21	9	42

Not divisible
by 3

A Pocket Full of Coins

Janice has \$2.46 worth of coins in her pocket. The coins are of four different denominations, and she has the same number of each denomination. What are the four denominations, and how many of each does she have?

4q
4d
5c
QDNPC

Fill in the Missing Square

Can you fill in the missing square with the number that logically belongs there?



2	2	2	2
2	6	10	14
2	10	26	50
2	14	30	50

The Wall

If the Jones twins can build a wall five bricks long and five bricks high in 1 minute, how long will it take them to build a wall ten bricks long and ten bricks high?

51
5
105
1 min

Sale!

An online shopping site reduced the price of one computer model by 25 percent for a sale. By what percentage of the sales price must it be increased to put the computer model back at its original price?

100 -> 75 + 1.33%
- x .25

Jack, Tom, Rich, and Mike are the best of friends, yet they have many differences. From the statements below determine the favorite sport, ~~soft drink~~, ~~color~~, and ~~pet~~ of each of the boys. Also determine the order of their ~~ages~~. The oldest boy goes in the number one space the next to the oldest in the second space and so on. Use the spaces below to organize your answers.

1. The boy who likes yellow plays golf.
2. The youngest boy owns a hamster.
3. The tennis player is on the left of the golf player.
4. The baseball player is not the oldest.
5. The tennis player drinks Coke.
6. The basketball player is on the right of the baseball player.
7. The boy who drinks 7-Up owns a parakeet.
8. The Dr. Pepper drinker wears red.
9. The tennis player likes white.
10. The oldest boy owns a dog.
11. The boy on the right of the Pepsi drinker likes blue.
12. The golfer owns a cat.
13. Mike drinks Pepsi and does not wear red.
14. The hamster does not belong to Tom.
15. The oldest boy does not wear red.
16. Tom is not next to the dog owner.
17. Mike is not the youngest.
18. Rich drinks coke.
19. Jack does not own a parakeet.
20. Tom likes blue.
21. The boy who wears blue drinks 7-Up.

	#1	#2	#3	#4
BOY	Rich	Mike	Tom	Jack
SPORT	Tennis	Golf	Baseball	Basketball
DRINK	Coke	Pepsi	7-Up	Dr. Pepper
COLOR	White	Yellow	Blue	Red
PET	Dog	Cat	Parakeet	Hamster

332.50

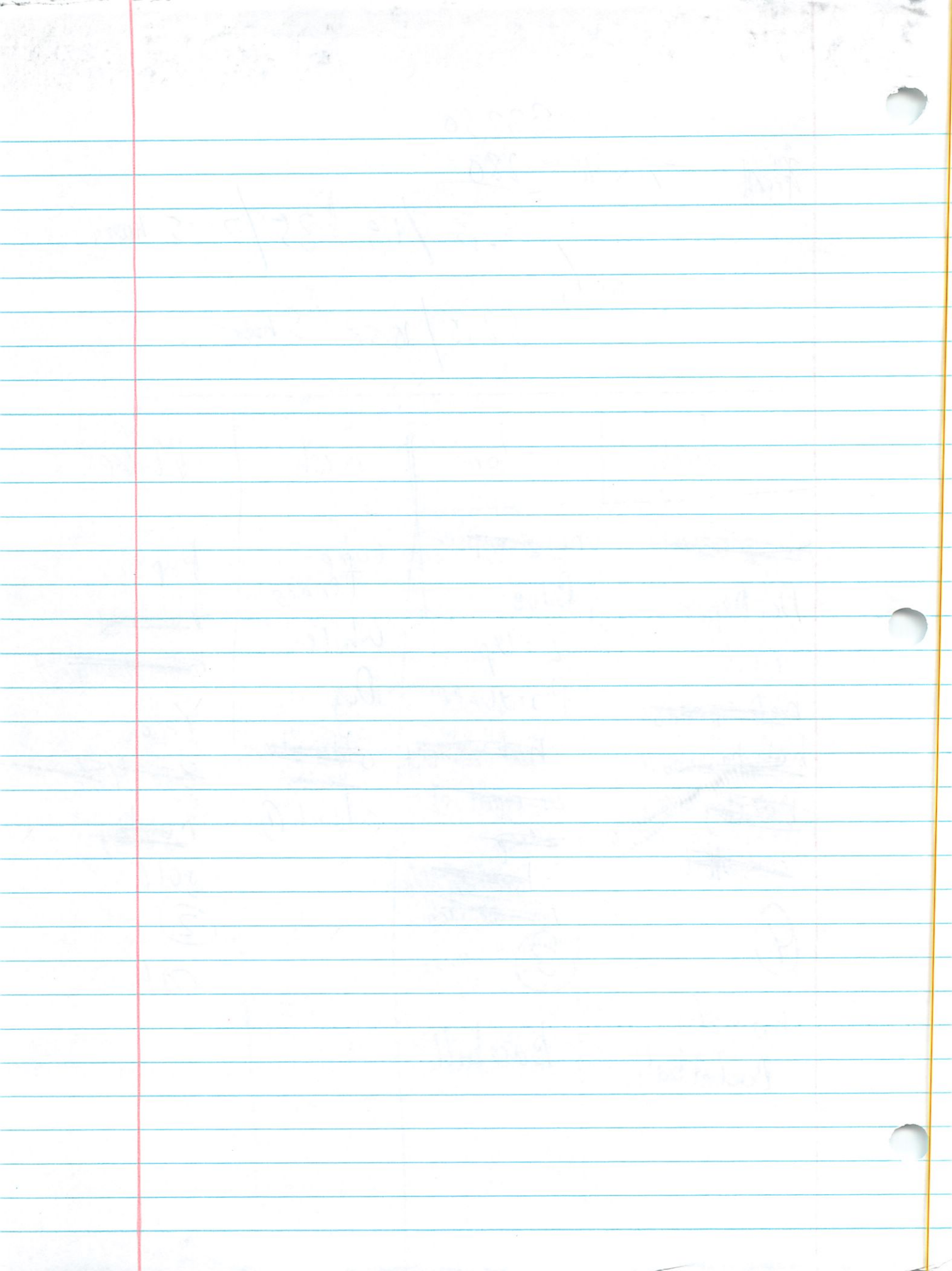
~~7~~ 7 x 40 = -280

52.5 / 1.5 = 35 / 7 = 5 hours

or 6

52.5 / 10.5 = 5 hours

Jack	Tom	Rich	Mike
no parasite	not hamster	Coke	Pepsi
Dr. Pepper	Blue	Tennis	not red
red	7-Up	white	not longest
not oldest	Parade	Dog	Yellow
not baseball	not longest	older than	3rd 4th 5th
no dog	on right of	Mike	no dog
not #1	Mike	oldest ①	golf
④	older than Mike		②
hamster	not near rich		cat
Basketball	Baseball		



Number Block

key

-x	+x
+x	-x

				25
9	3	4	6	19
2	0	8	5	15
2	3	6	8	19
8	0	4	7	19
21	6	19	26	22



~~6039~~ ~~9307~~
~~2342~~ ~~2094~~
~~5338~~ ~~7368~~
~~8047~~ ~~8047~~

Try to fill in the missing numbers.

The missing numbers are integers between 0 and 9.
 The numbers in each row add up to totals to the right.
 The numbers in each column add up to the totals along the bottom.
 The diagonal lines also add up the totals to the right.

Solution

Save to My Custom Classroom Account

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DiscoverySchool.com

Math Square

6	/	8	x	2	28
-		x		+	
1	-	7	x	4	-23
x		+		+	
5	x	9	-	3	42
-1		17		14	

Not
Solved

Try to fill in the missing numbers.

Use the numbers 1 through 9 to complete the equations.

Each number is only used once.

Each row is a math equation. Each column is a math equation.

Remember that multiplication and division are performed before addition and subtraction.

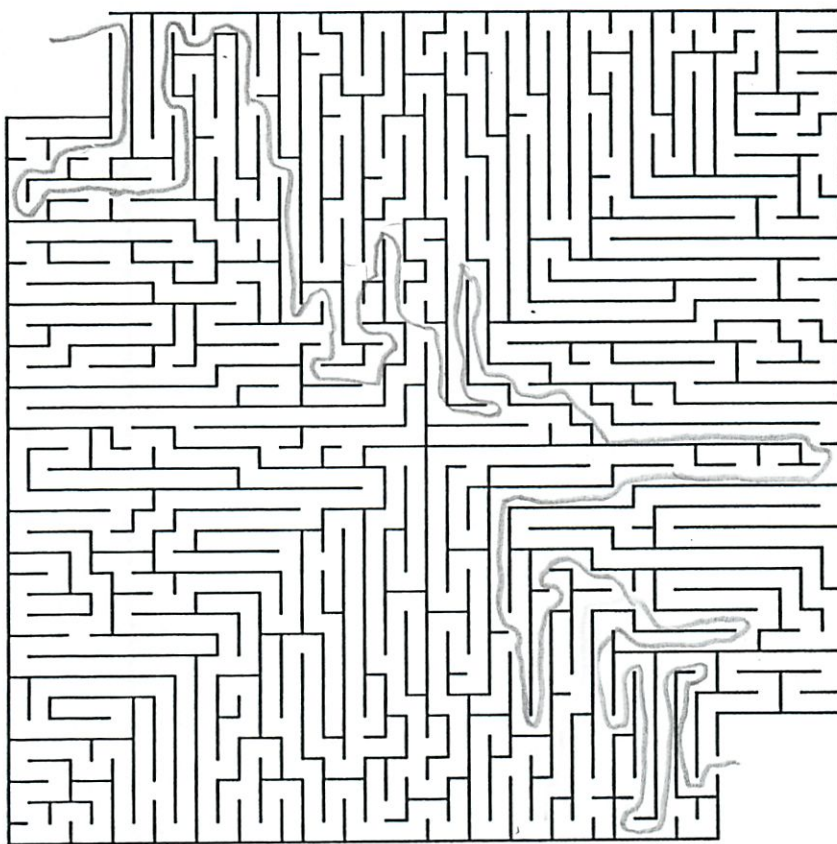
Solution

Save to My Custom Classroom Account

Created by Puzzlemaker at DiscoverySchool.com

DiscoverySchool.com

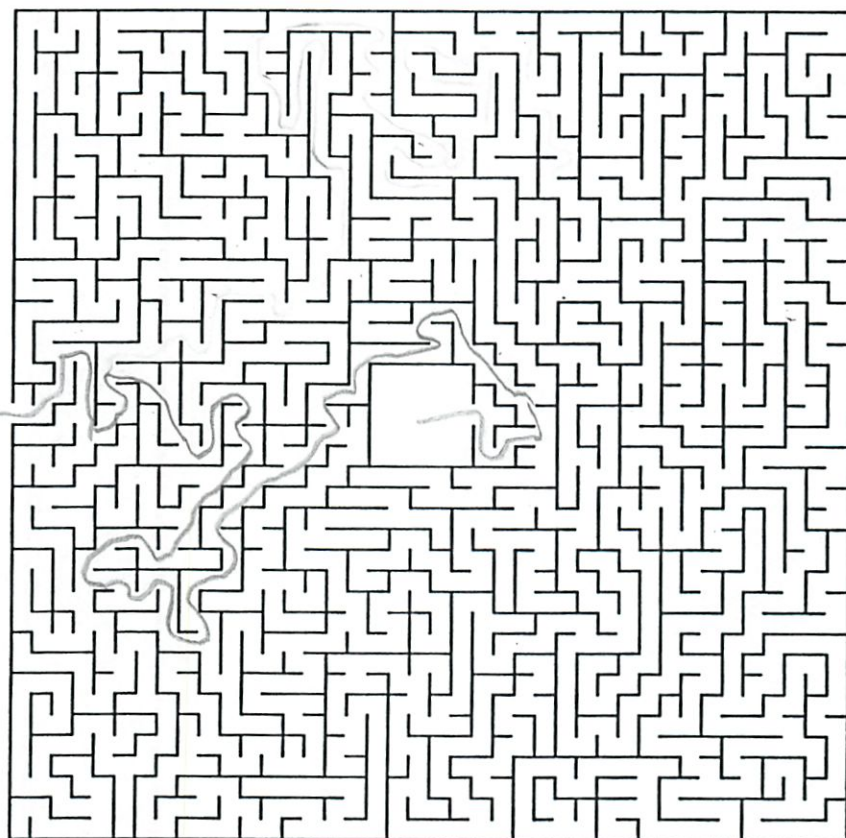
After Quiz Activity



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After Quiz Activity



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Michael Plasmeier
behl
TAG 2/19
27 Oct 2005

Slope + Y-intercept notes

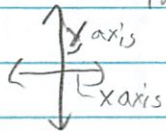
(33)

10/27

Slope = steepness of a line

y-intercept = point where the line crosses the y-axis

- the y-intercept point will always have 0 as x value $(0, y)$



Linear equation = equation of a straight line

Standard linear equation: $y = mx + b$

m = Co-efficient of x for slope (varies w/ x)
 b = y-intercept value (constant term)

ex: $y = 3x + 4$ $\rightarrow$ y-intercept point $(0, 4)$
 $\uparrow$
slope = 3

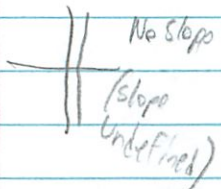
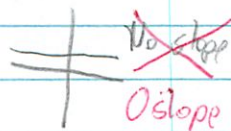
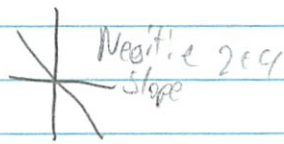
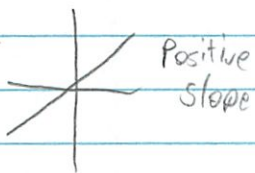
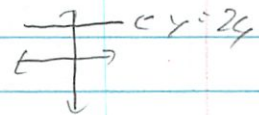
$y = -2x + 5$ $\rightarrow$ $(0, 5)$ is a point
 $\uparrow$
slope = -2

$y = \frac{1}{2}x - 7$ $\rightarrow$ $(0, -7)$
 $\uparrow$
slope = $\frac{1}{2}$

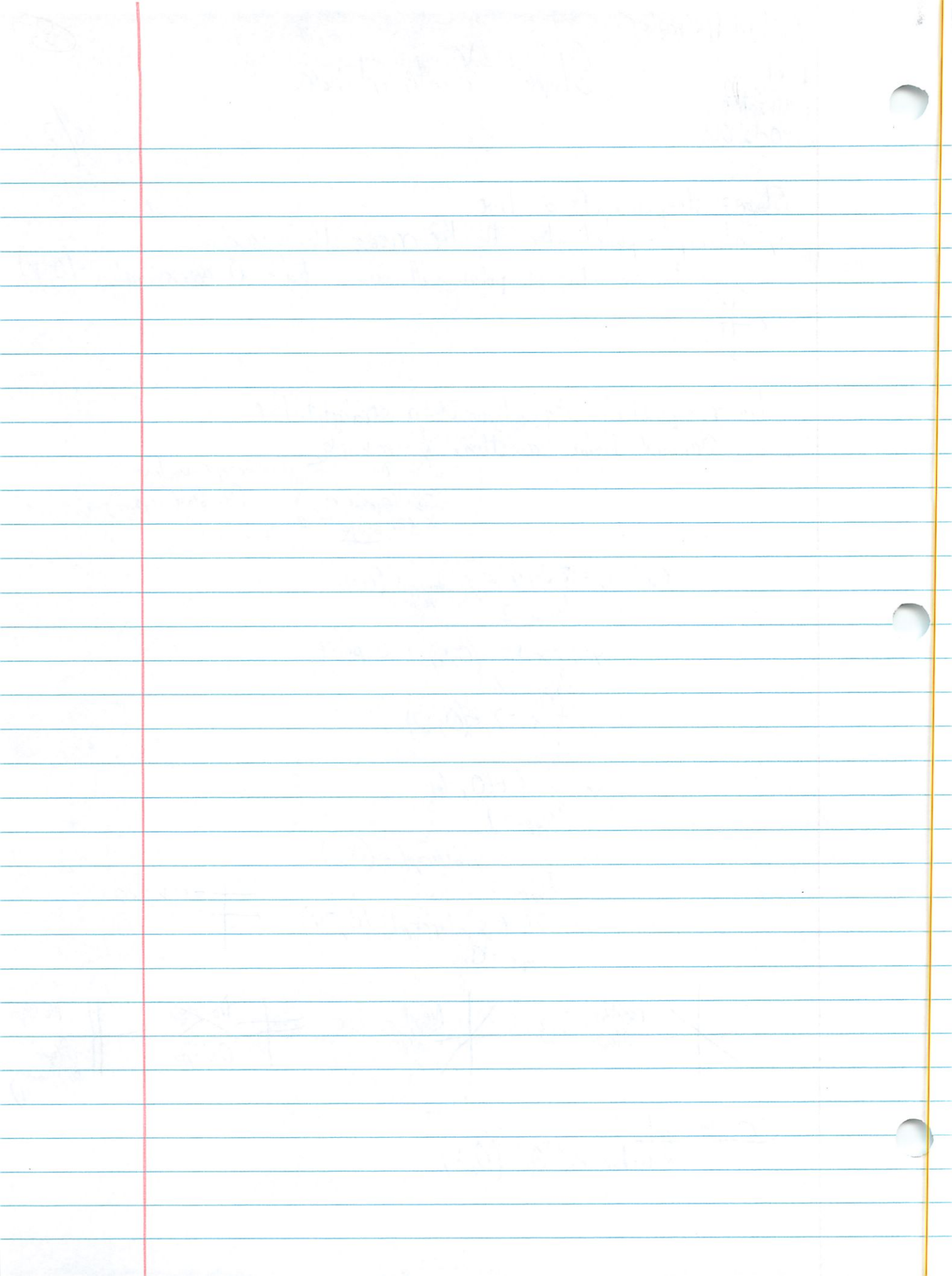
$y = x - 6$ $\rightarrow$ $(0, -6)$
 $\uparrow$
slope = 1

$y = 9x$ $\rightarrow$ y-intercept = $(0, 0)$
 $\uparrow$
slope = 9

$y = 24$ $\rightarrow$ y-intercept = $(0, 24)$
 $\uparrow$
slope = 0



y-intercept
x value is 0 $\rightarrow (0, y)$



Name Michael Plasner
Date _____

Slope and Y-intercept Review

- 1) What is the y-intercept? the point where the line crosses the y-axis
 - 2) Define coefficient What the variable or 2nd num or part of multiplication problem is multiplied by ex: $3x$ 3 is coefficient of x
 - 3) What is the standard linear equation form? $y = mx + b$
 - 4) In the standard linear equation form, where is the slope value located? m
 - 5) In the standard linear equation form, where is the y-intercept value located? b
- Handwritten notes:*
 → # the variable is multiplied by
 → # in front of variable

For each of these In/Out Tables, state the rule (equation of the line), the slope, and the y-intercept.

6)

In	Out
-3	-21
-1	-11
0	-6
1	-1
2	4

$$\frac{5}{1} = 5x - 6$$

Rule = $5 \cdot \text{In} - 6$
 Slope = 5
 Y-intercept = $(0, -6)$
 point

7)

In	Out
-2	6.5
0	7
1	7.25
3	7.75
4	8

$$\frac{.25}{1} = .25x + 7$$

Rule = $.25 \cdot \text{In} + 7$
 Slope = .25
 Y-intercept = $(0, 7)$
 point

8)

In	Out
-4	19
-2	11
0	3
1	-1
2	-5

$\times 1$ ~~$+4$~~

$$-\frac{4}{1} = -4x + 3$$

Don't forget to check

$$-4(0) + 3$$

$+3 \text{ @}$

$$-4(2) + 3$$

$$-8 + 3$$

$$-5 \text{ @}$$

Do this for all entries

looking error
stupid mistake

$$\text{Rule} = 4(I_n) + 3$$

$$\text{Slope} = -4$$

$$\text{Y-intercept} = (0, 3)$$

$$-4 \text{ intercept value} = 3$$

9)

In	Out
-1	9
1	-9
2	-18
3	-27

$$-\frac{9}{1} = -9x$$

$$\text{Rule} = -9(I_n)$$

$$\text{Slope} = -9$$

$$\text{Y-intercept} = (0, 0)$$

10)

In	Out
-2	2.2
0	1
1	.4
2	-.2
3	-.8

$$\text{Rule} = -.6(I_n) + 1$$

$$\text{Slope} = -.6$$

$$\text{Y-intercept} = (0, 1)$$

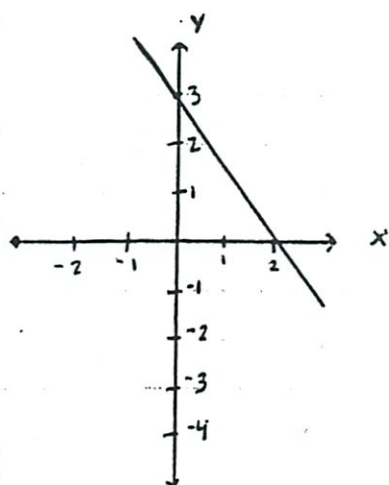
watch the
- sign

Copy error

$$-\frac{.6}{1} = -.6x + 1$$

For these next four problems, look at the graph and determine the y-intercept for each one.

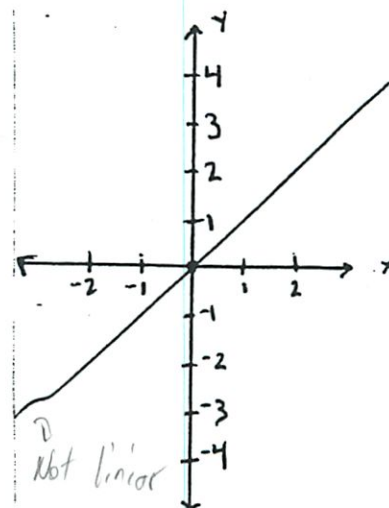
11)



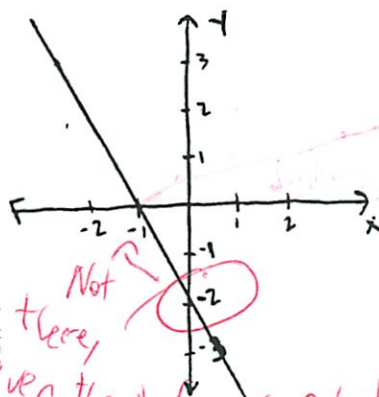
Y-intercept = $(0, 3)$
point

12)

Y-intercept = $(0, 0)$
point



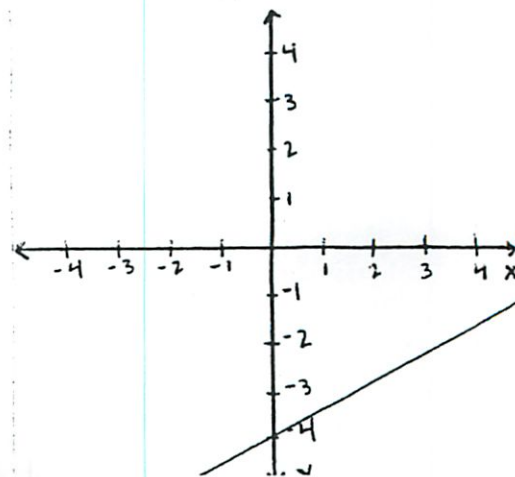
13)



Y-intercept = $(0, -2)$

14)

Y-intercept = $(0, -4)$



Quiz Review Topics



to study

11/2

Quiz topics

- Distributive property + simplifying equations
- Multiplying equations (either FOIL, Box, Vertical)
- Factoring out common terms
- Given an expression, determine 2 expressions that were used to make it

Review Problems

1. $5a(a-3)$

$$5a(a) + 5a(-3)$$

$$5a^2 - 15a$$

2. $-2x^2(x-7x)$

$$-2x^2(x) - 2x^2(-7x)$$

$$-2x^3 + 14x^3$$

3. $3x + 4 - (2x - 5) = 10$

$$3x + 4 - 2x + 5 = 10$$

$$\begin{array}{ccc} -4 & -5 & -1 \end{array}$$

$$3x - 2x = 1$$

$$(x=1)$$

4. $(x+3)(x-5)$

$$x(x) + x(-5) + 3(x) + 3(-5)$$

$$x^2 - 2x - 15$$

Don't forget to Check!

5. $(-2x+6)(x-4)$

$$-2x(x) - 2x(-4) + 6(x) + 6(-4)$$

$$-2x^2 + 8x + 6x - 24$$

$$-2x^2 + 14x - 24$$

~~6. $x^2 - 10x + 21$~~

$$(x-3)(x-7)$$

Factor out

7. $36xy + 81xz$

$$9x(4y + 9z)$$

Factor out

~~8. $11ub + 22mb + 66cb + 88db^2$~~

$$11b(u + 2m + 6c + 8db^2)$$

When you multiply these together

9. $x^2 - 4x - 12 = (x+2)(x-6)$

10. Over $\rightarrow$ it will be

$$11b \times 8db$$

$$b \times b = b^2$$

$$10. (2x-5) - (5x+3) + 5 = 2x-4$$

$$2x-5-5x-3+5=2x-4$$

$$-3x-3=2x-4$$

$$+3x \quad +3x$$

$$-3=5x-4$$

$$+4 \quad +4$$

$$1=5x$$

$$\frac{1}{5} = \frac{5x}{5}$$

$$\left(\frac{1}{5} = x\right)$$

$$11. x^2 - 49$$

difference of squares

$$(x+7)(x-7)$$

$$a^2 - b^2$$

Name Michael Plasmeier
Period 2B
Date 11/1

Slope and Y-intercept

Directions: For each of these In/Out tables, determine the rule (equations of the line), plot the coordinates on a graph, and state the slope and y-intercept.

1)

In	Out
-2	-4
-1	-1
0	2
1	5
2	8

$\frac{3}{1} = 3x + 2$

Rule = $3x + 2$
Slope = $3x$
Y-intercept = $+2$ (0, 2)

2)

In	Out
-1	-13
0	-12
1	-11
2	-10

$\frac{1}{1} x - 12$

Rule = $x - 12$
Slope = x
Y-intercept = -12 (0, -12)

Check!
 $x = x - 12$
 $-11 = x - 12$
 $+12$
 $1 = x$
 $\checkmark$ Do for all

3)

In	Out
-2	9
-1	7
0	5
1	3
2	1

 $+1 \left[\begin{array}{cc} 0 & 5 \end{array} \right] - 2$

$$\frac{-2}{1} = -2x + 5$$

Rule = $-2x + 5$
 Slope = $-2x$
 Y-intercept = $+5$ (0,5)

4)

In	Out
-2	2
-1	2.5
0	3
1	3.5
2	4

 $+1 \left[\begin{array}{cc} 0 & 3 \end{array} \right]$

$$+1.5 \quad \frac{.5}{1} = .5x + 3$$

Rule = $.5x + 3$
 Slope = $.5x$
 Y-intercept = $+3$ (0,3)

5)

In	Out
-2	-14
-1	-7
0	0
1	7
2	14

 $+1 \left[\begin{array}{cc} 0 & 0 \end{array} \right] + 7$

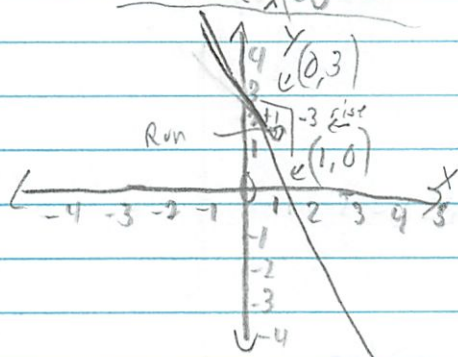
$$\frac{7}{1} = 7x + 0$$

Rule = $7x$
 Slope = $7x$
 Y-intercept = $0,0$ (0,0)

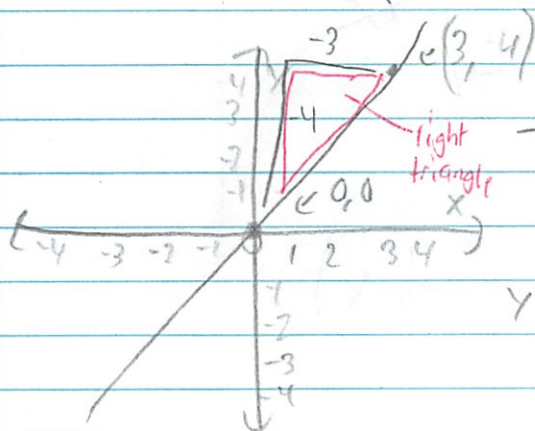
Slope = steepness or rate of change

2 methods for finding slope

1. $\frac{\text{Rise}}{\text{Run}}$ (graphically)



$\frac{\text{Rise}}{\text{Run}} = \frac{\Delta y}{\Delta x} = \frac{-3}{1} = -3$



$\frac{\text{Rise}}{\text{Run}} = \frac{4}{3} = \text{slope}$

$y = \frac{4}{3}x$

1. Select 2 points that are directly on line
2. Connect the 2 points w/ a right triangle

How to solve algebraically $\rightarrow$
(2 point-formula)

2 point formula

1. Need 2 points on line (x_1, y_1) (x_2, y_2)

2. Subtract $\frac{\Delta y}{\Delta x}$ or $\frac{y_2 - y_1}{x_2 - x_1}$

3. Get slope

4. Find y-intercept point

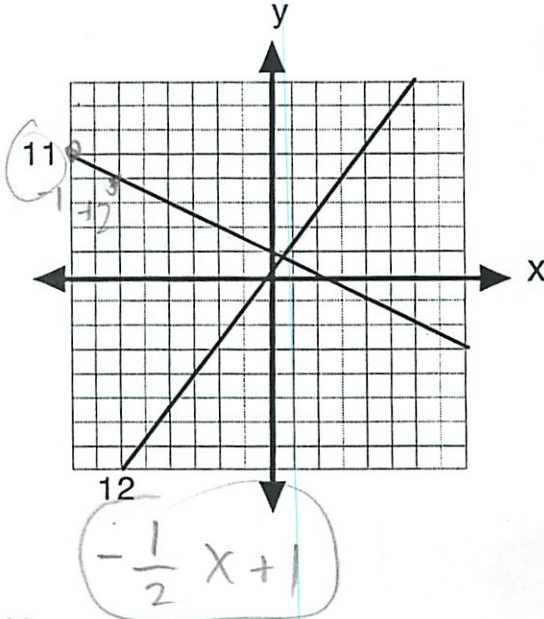
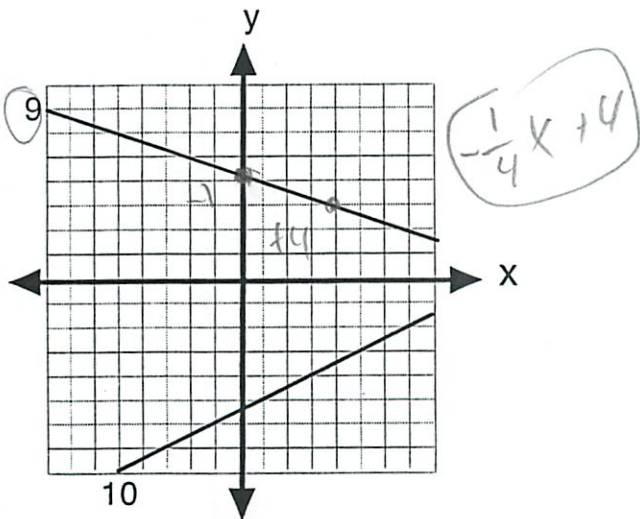
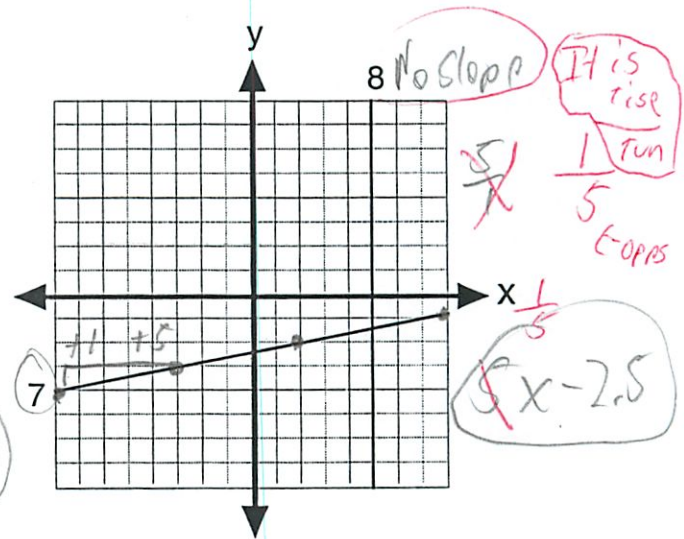
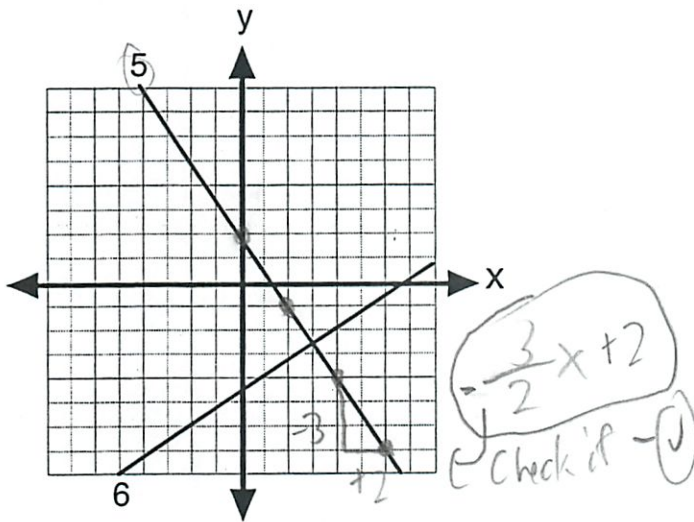
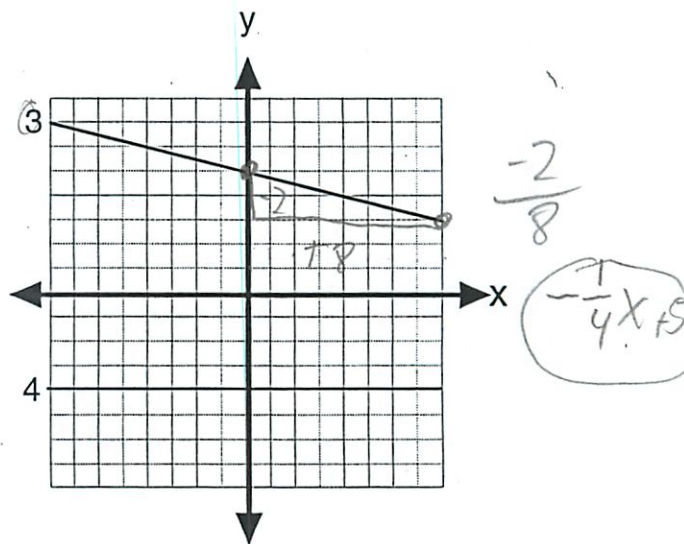
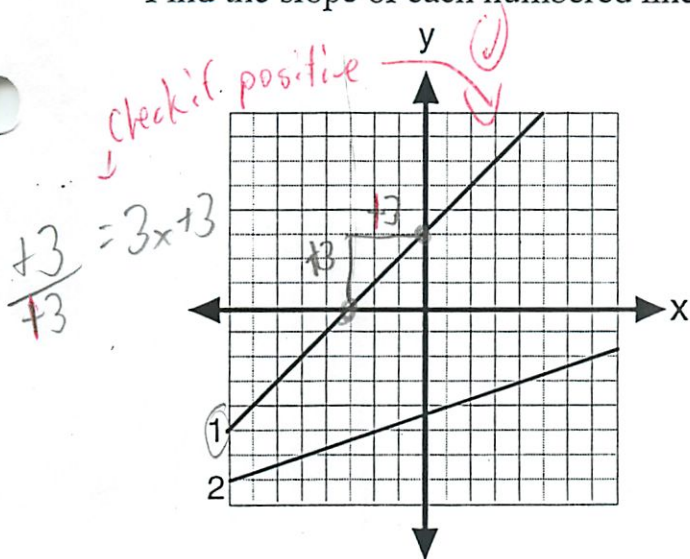
Ex. $(-2, 5)$ $(0, 3)$

$$\frac{-3 - 5}{0 - -2} = \frac{-8}{2} = -4$$

Ex $(4, -3)$ $(-2, -1)$

$$\frac{-1 - -3}{-2 - 4} = \frac{2}{-6} = -\frac{1}{3}x$$

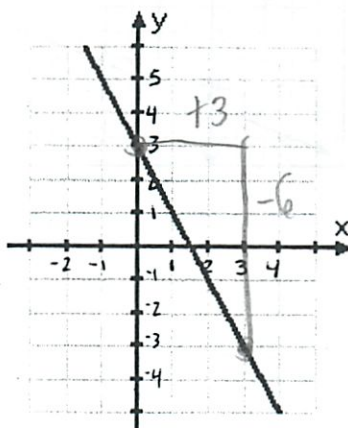
Find the slope of each numbered line.



Name Michael Plasmeior
Period _____
Date _____

Slope Review Worksheet

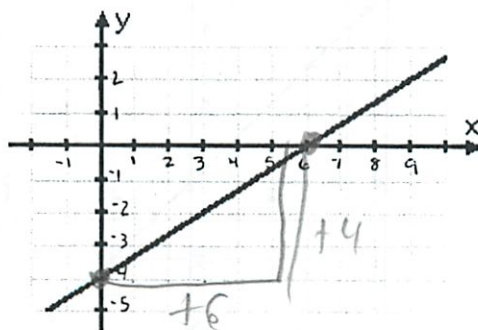
- 1) Find the slope of this line by using the rise and run method.



$$\frac{-6}{3}$$

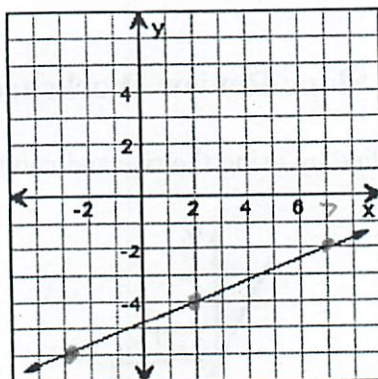
$$-2x + 3$$

- 2) Find the slope of this line by using the rise and run method.



$$\frac{4}{6} = \frac{2}{3}x - 4$$

- 3) Find the slope of the line below. Tell whether the line has a positive or negative slope. Be sure to show all of your work!!!!



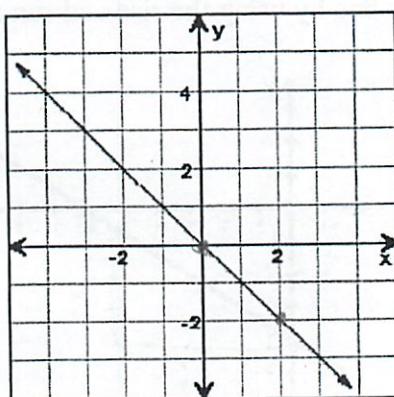
$$\begin{aligned} (2, -4) \\ (7, -2) \end{aligned}$$

$$\frac{-4 - (-2)}{7 - 2}$$

$$\frac{-2}{-5}$$

$$= \left(\frac{2}{5}x - 4.8 \right)$$

- 4) Find the slope of the line below. Tell whether the line has a positive or negative slope. Be sure to show all of your work!!!!

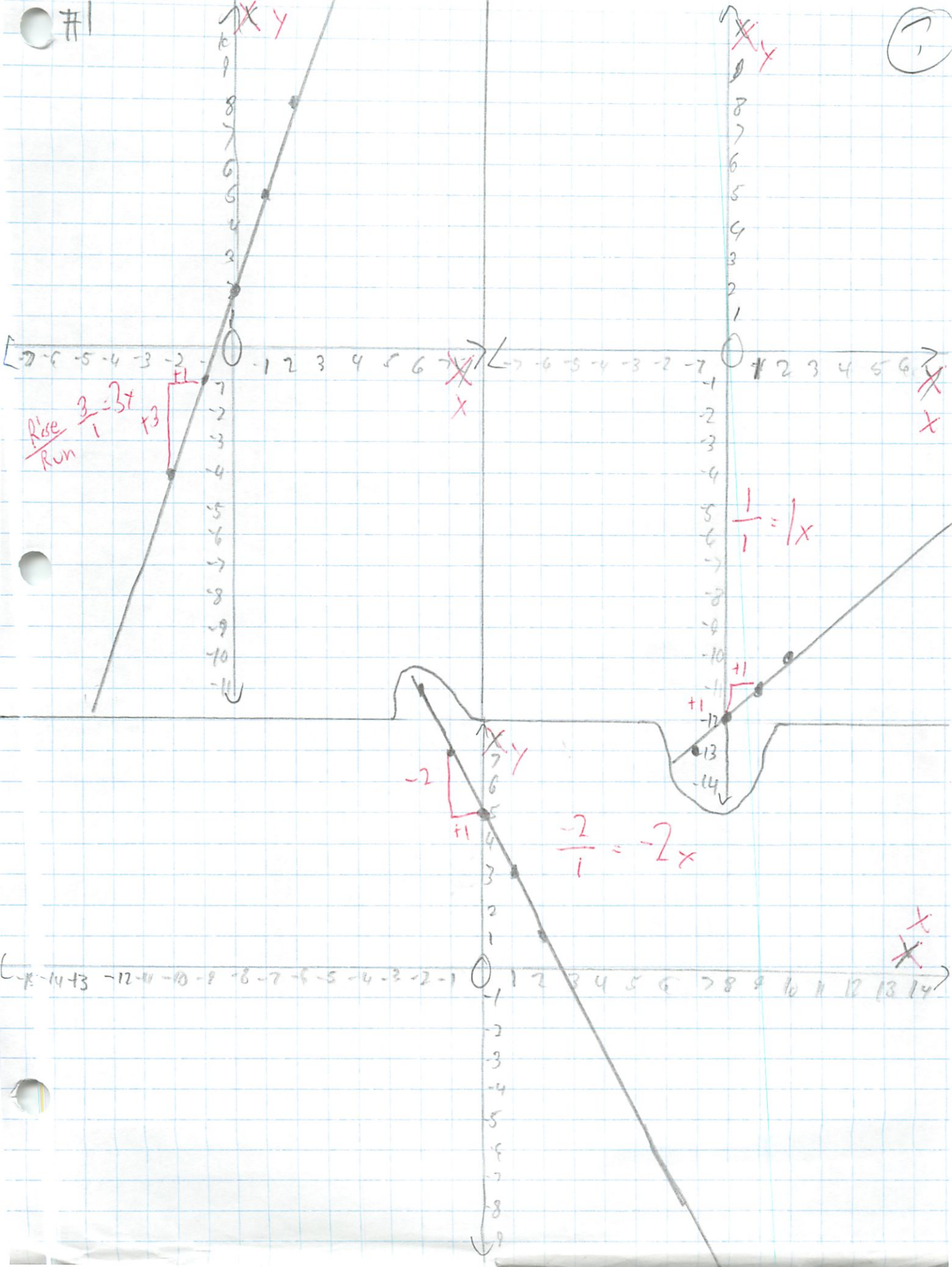


$$\begin{aligned} (0, 0) \\ (2, -2) \end{aligned}$$

$$\frac{-2 - 0}{2 - 0}$$

$$\frac{-2}{2}$$

$$= -x$$





Name
Period
Date

Michael Plasencia

Slope and Writing an Equation Review

1. In the standard linear equation $y = mx + b$

a. What does the m represent?

The coefficient of the x
the slope value

b. What does the b represent?

The y-intercept value and a point on the line $(0, -)$

2. Given the equation $y = 3x + 4$

a. What is the slope of this line?

$3x \rightarrow$ Just say 3

b. What is the y-intercept? point

$(0, 4)$

3. Given the equation $y = x - 3$

a. What is the slope of this line?

$1x \rightarrow$ Just say 1

b. What is the y-intercept?

$(0, -3)$

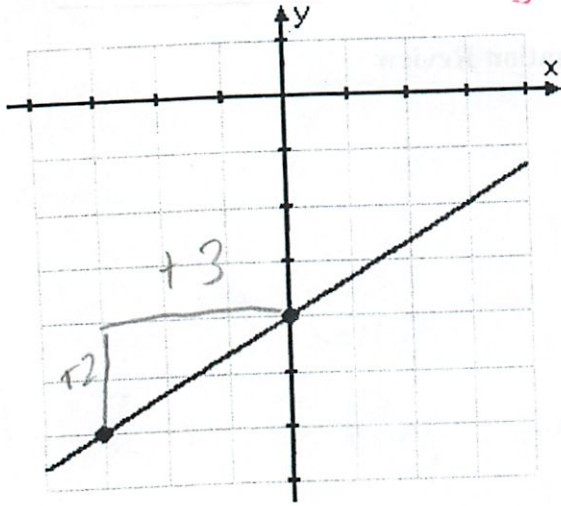
4. Write an equation for the line with the slope of 7 and y-intercept $(0, 2)$

$$y = 7x + 2$$

5. Write an equation for the line with the slope of 0 and y-intercept $(0, -3)$

$$y = -3$$

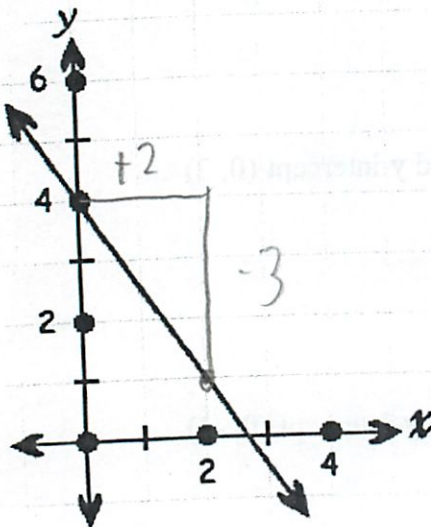
6. Find the slope of this line. You may use any method you want. Be sure to show all of your work! *Value = $\frac{2}{3}$*



$$\frac{2}{3}x - 4$$

Rise
run

7. Find the slope of this line. You can use whichever method you want. Be sure to show all of your work! *Value = $-\frac{3}{2}$*



$$-\frac{3}{2} = -\frac{3}{2}x + 4$$

Michael Plasner
Behl
IAG210
4 Nov 2005

Slope + Y-intercept Check Up

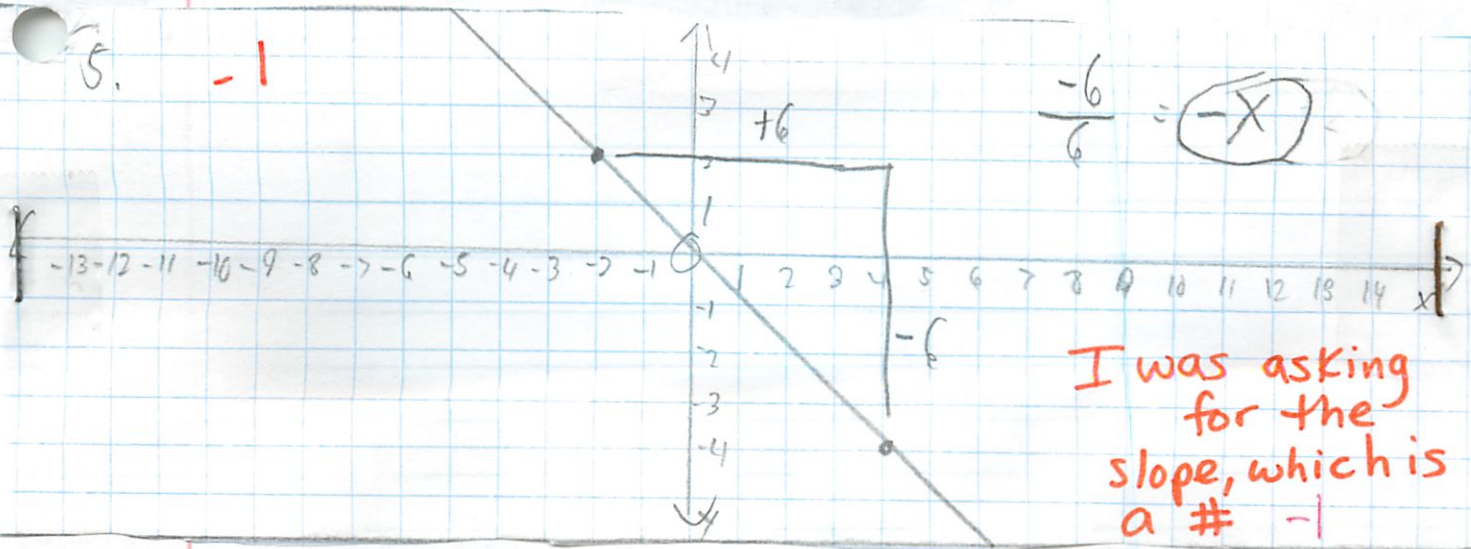
~~31/32~~ (40)
31/32 11/9

1. Slope = 9x
Y-intercept point = (0, 10)
Y-intercept value = 10

2. Slope = 1x
Y-intercept point = (0, -35)
Y-intercept value = -35

3. $y = 8x$

4. $y = \frac{1}{2}x - 3$



I was asking
for the
slope, which is
a # -1

6. $\begin{pmatrix} 2, 7 \\ -3, -1 \end{pmatrix}$

$$\frac{-1-7}{-3-2} = \frac{-8}{-5} = \frac{8}{5}x$$

Then ask for
slope value

this is what the
question is
asking for $\frac{8}{5}$

~~3/13~~
31/35

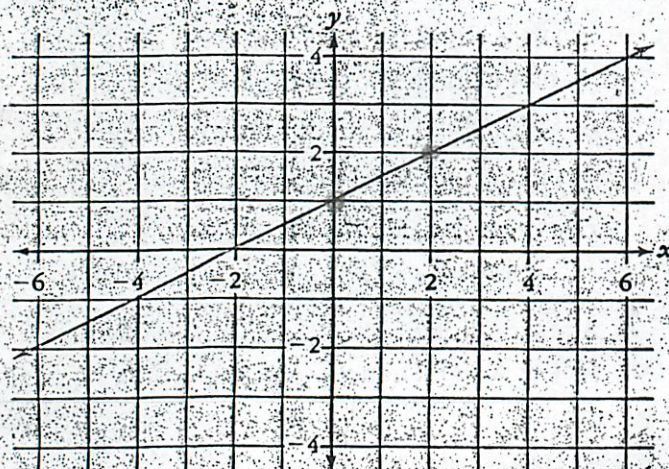
defect
is not the
this is not the

- b. Find an equation for this function.
- c. Choose two points on your graph and use their coordinates to compute the slope of the graph.

3. a. Plot the data in this In-Out table.

In	Out
3	18
5	26
10	46
16	70

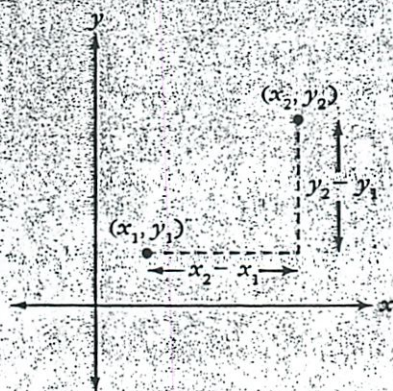
- b. Choose two points on your graph and use their coordinates to compute the slope of the line connecting them.
 - c. Find an equation to describe your graph in part a.
4. a. Choose two points on the line shown here and use their coordinates to compute the slope of the line.



- b. Find an equation for the line.

6

Rates, Graphs, Slopes, and Formulas



The concept of slope is an abstraction from the idea of a rate of change. Formally, the slope of the line connecting two points (x_1, y_1) and (x_2, y_2) is defined as the ratio

$$\frac{y_2 - y_1}{x_2 - x_1}$$

The numerator of this fraction is sometimes referred to as the change in y or the rise. The denominator is called the change in x or the run.

In these problems, you will work with both rates and slopes, exploring their connections to both graphs and formulas.

1. A jogger is moving along at a rate of 500 feet per minute. (That's about 6 miles per hour.)
 - a. Use $t = 0$ as the time when the jogger starts, and plot a graph showing the distance the jogger has gone (in feet) as a function of t (in minutes).
 - b. Find an equation for this function.
 - c. Choose two points on your graph and use their coordinates to compute the slope of the graph.
2. A reservoir is partly filled and contains 200,000 cubic feet of water. Then water is added at a rate of 7000 cubic feet per hour.
 - a. Use $t = 0$ as the time when the water begins to be added, and plot a graph showing the amount of water in the reservoir as a function of t . (You may want to "skip" part of the vertical axis as was done in the graph in *Homework 2: Growing Up*.)

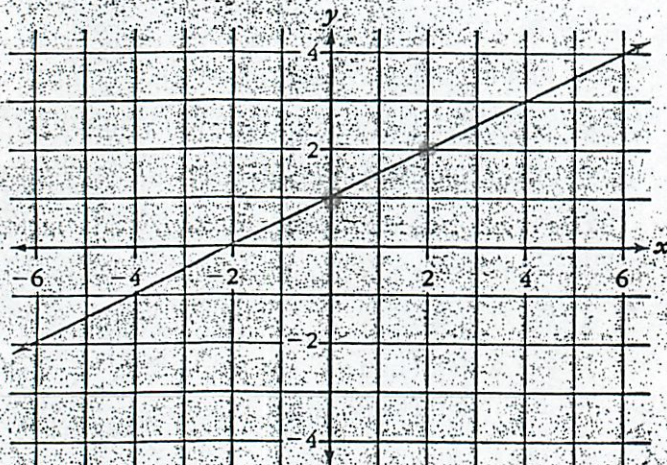
Continued on next page

- b. Find an equation for this function.
- c. Choose two points on your graph and use their coordinates to compute the slope of the graph.

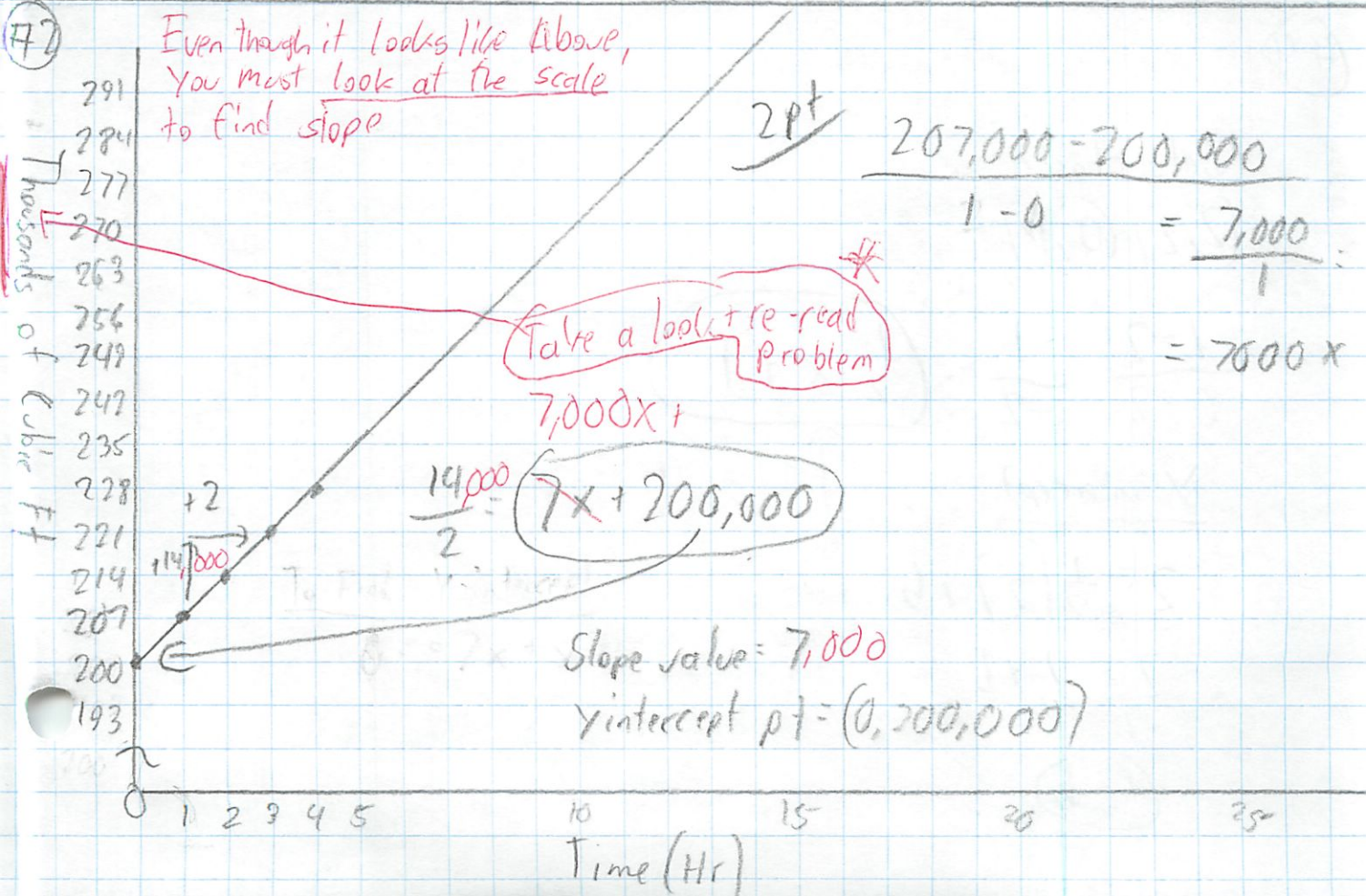
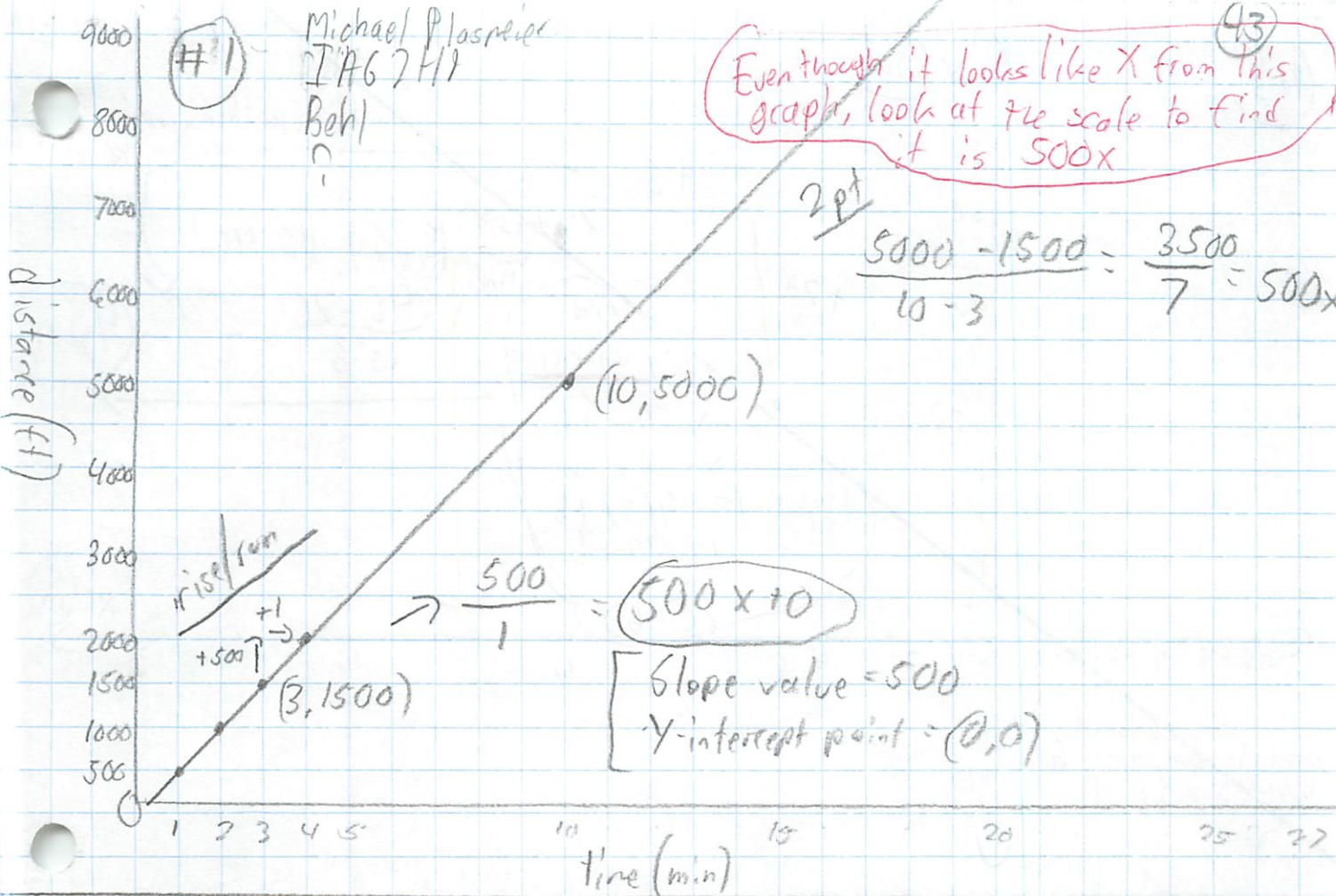
3. a. Plot the data in this In-Out table.

In	Out
3	18
5	26
10	46
16	70

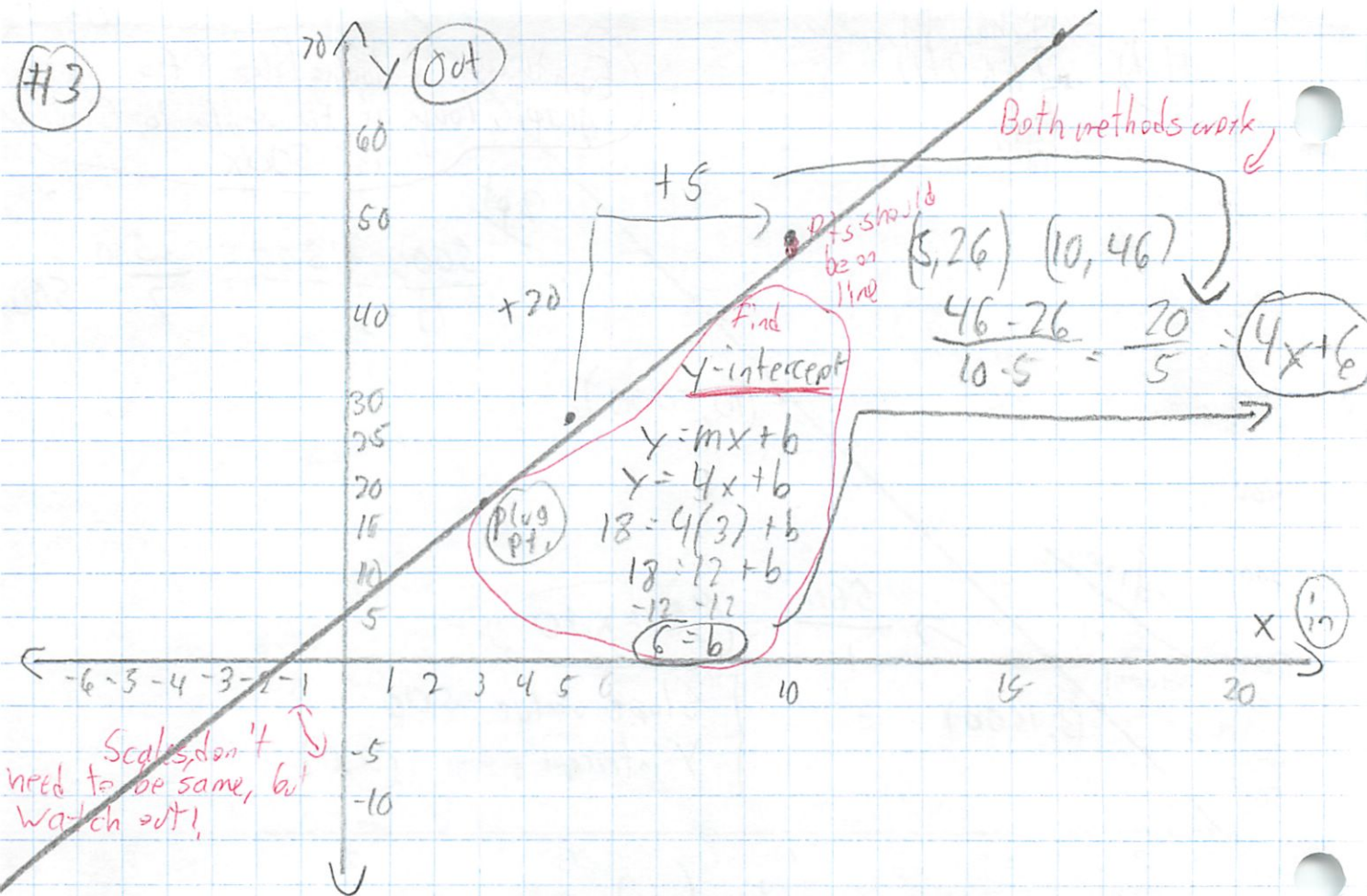
- b. Choose two points on your graph and use their coordinates to compute the slope of the line connecting them.
 - c. Find an equation to describe your graph in part a.
4. a. Choose two points on the line shown here and use their coordinates to compute the slope of the line.



- b. Find an equation for the line.



#13



#14

Points chosen

(2, 2) (0, 1)

$$\frac{1-2}{0-2} = \frac{-1}{-2} = \frac{1}{2}x + 1$$

y-intercept

$$2 = \frac{1}{2}(2) + b$$

$$2 = 1 + b$$

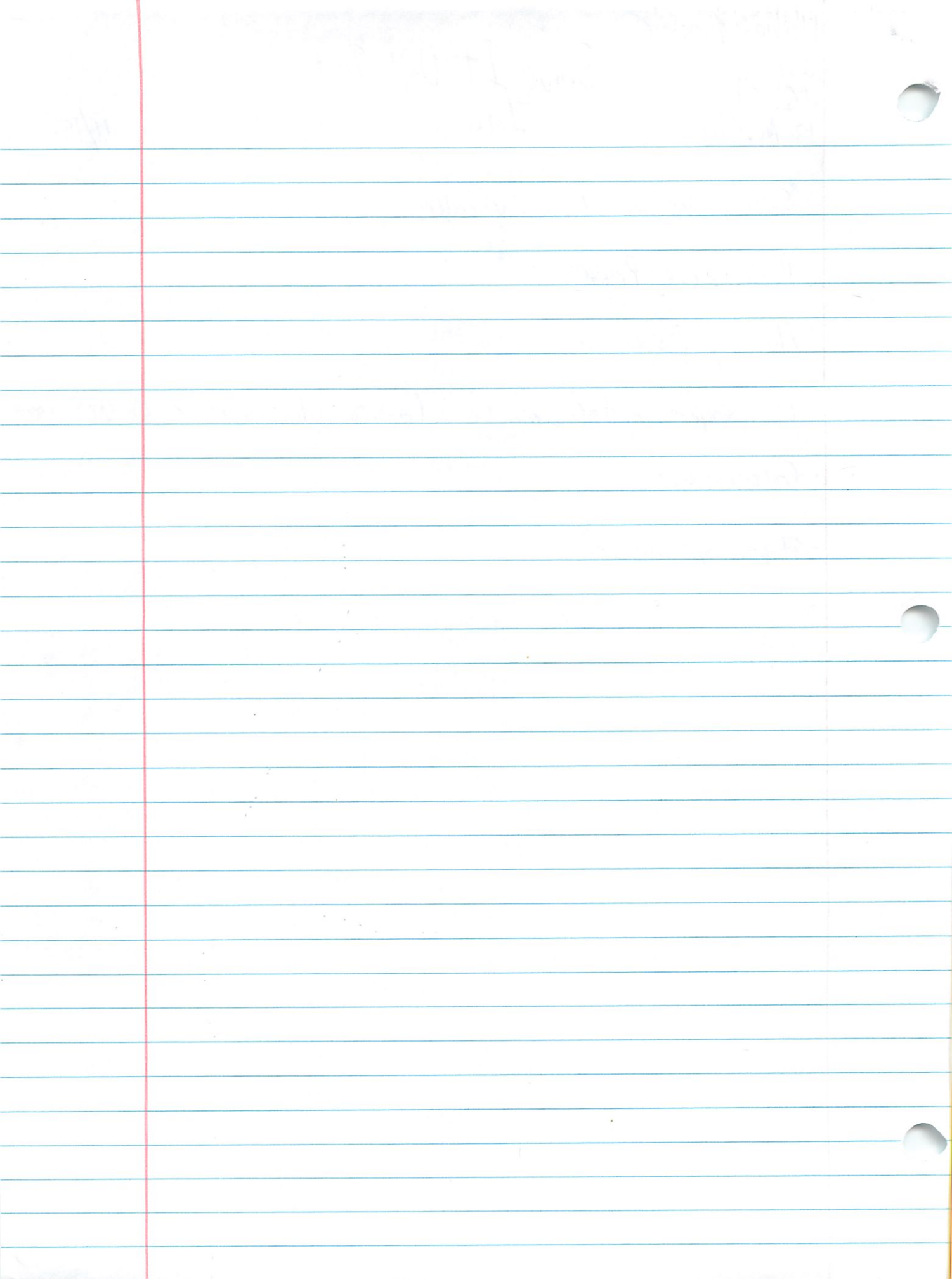
$$1 = b$$

Michael Plascior
Behl
JAG 21A
15 Nov 2005

Solve It Unit Test Info

11/15

- Solving equations w/ 1 or 2 variables
- Distributive Property
- Multiply Expressions
- Given expression, determine the 2 factors what were x to get that
- factoring out
- slope & y-intercept



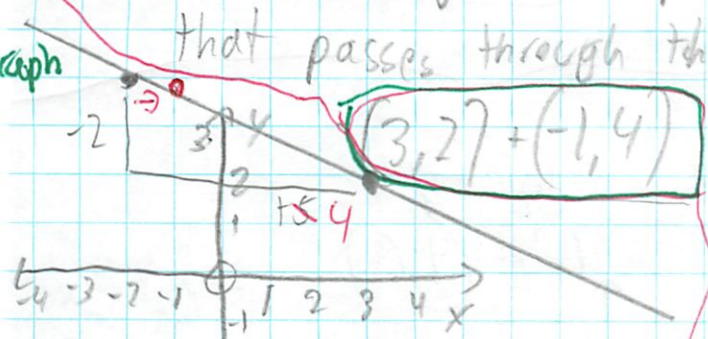
Michael Plasencia
 Behl
 T46 2H9
 15 Nov 2005

Finishing up Slope + Y-intercept

11/15

Situation 1: given 2 points, find the equation of the line that passes through those 2 points

Graph



2pt $\frac{y_2 - y_1}{x_2 - x_1} = \frac{4 - 2}{-1 - 3} = \frac{2}{-4} = -\frac{1}{2}$

$\frac{y_2 - y_1}{x_2 - x_1}$ $\frac{y_2 - y_1}{x_2 - x_1}$
 2nd lot

rise/run $\frac{-2}{4} = -\frac{1}{2}$

$-\frac{1}{2}x$

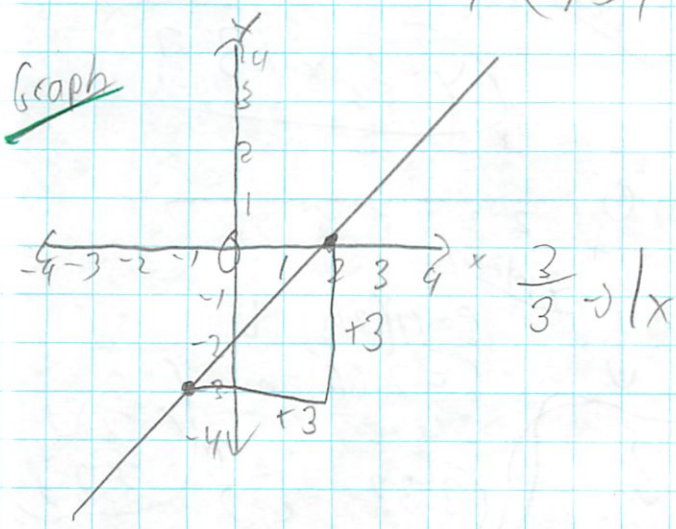
Find y-intercept

$2 = 3(-\frac{1}{2}) + b$
 $2 = -1.5 + b$
 $+1.5 +1.5$
 $3.5 = b$

$y = -\frac{1}{2}x + 3.5$

Situation 1b: (2, 0) (-1, -3)

Graph



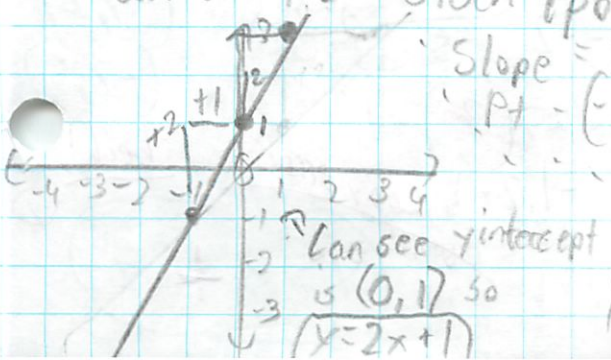
2pt $\frac{-3 - 0}{-1 - 2} = \frac{-3}{-3} = 1$

y-intercept $\leftarrow$ don't forget

$0 = 2(1) + b$
 $0 = 2 + b$
 $-2 = b$

$y = x - 2$

Situation #2: Given 1 point + slope, find equation of line



Slope = 2 $\rightarrow 2x$ or $\frac{2}{1}$
 Pt = (-1, -1)

Use point-slope & intercept finding

$-1 = -1(2) + b$
 $-1 = -2 + b$
 $+2 +2$
 $1 = b$

$y = 2x + 1$

Can see y-intercept is (0, 1) so $y = 2x + 1$

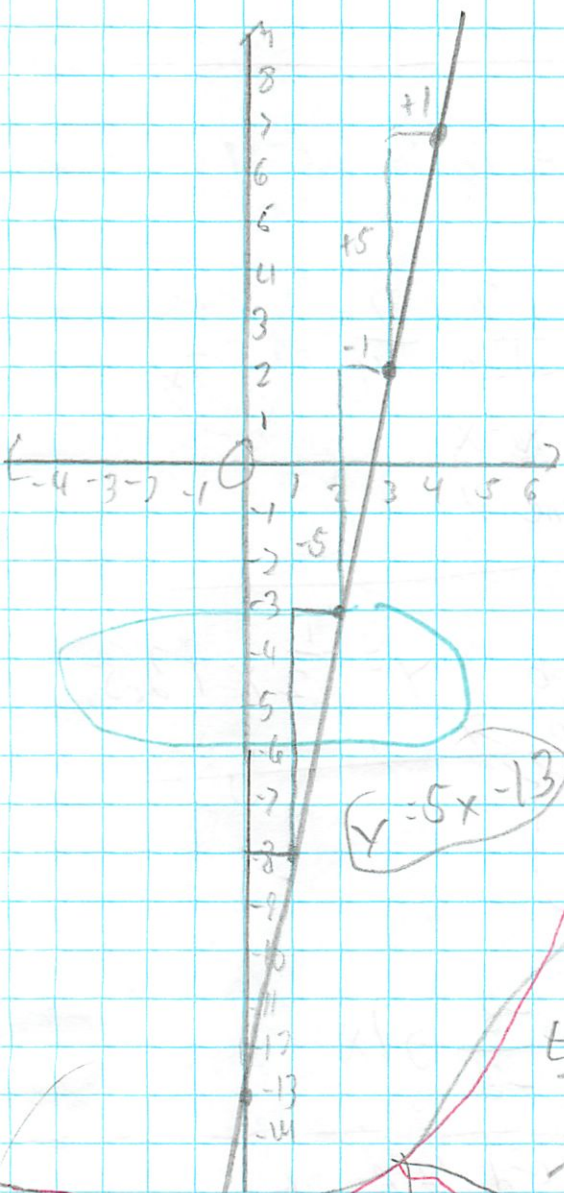
Try 2b: Slope = 5 or $\frac{5}{1}$
 point = (3, 2)

$$2 = 3(5) + b$$

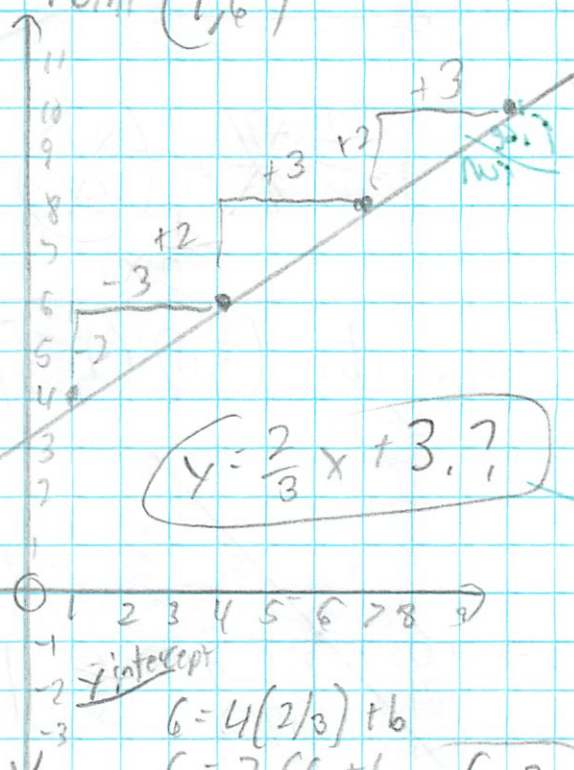
$$2 = 15 + b$$

$$-15 \quad -15$$

$$(-13 = b) \rightarrow y = 5x - 13$$



Try 2c Slope $\frac{2}{3}$
 Point (4, 6)



1. (6, 2) (8, 8)

$$\frac{8-2}{8-6} = \frac{6}{2} = 3x$$

$$2 = 6(3) + b$$

$$2 = 18 + b$$

$$-18 \quad -18$$

$$-16 = b$$

$$y = 3x - 16$$

2. (1, 5) (3, -1)

$$\frac{-1-5}{3-1} = \frac{-6}{2} = -3x$$

$$5 = 1(-3) + b$$

$$5 = -3 + b$$

$$+3 \quad +3$$

$$8 = b$$

$$y = -3x + 8$$

3

$$\frac{2-5}{-7-2} = \frac{-3}{-9} = \frac{1}{3}x$$

$$5 = -2(\frac{1}{3}) + b$$

$$5 = -\frac{2}{3} + b$$

$$+1.2 \quad +1.2$$

$$6.2 = b$$

$$y = \frac{1}{3}x + 6.2$$

$$6 = 4(\frac{2}{3}) + b$$

$$6 = 2.66 + b$$

$$-2.66 \quad -2.66$$

$$3.333 = b$$

$$y = \frac{2}{3}x + 3.33$$

(-7, 2)

(-2, 5)

check!

Copy error

Michael Masarik
Behl
IAG 2+19
15 Nov 2005

Solve It Practice Test

Excellent job!

11/15

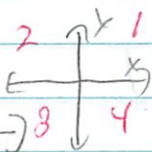
1. Solve for x : $\frac{1}{2}x - 5 = 9$

$$\begin{array}{r} +5 \quad +5 \\ \frac{1}{2}x = 14 \\ \times 2 \quad \times 2 \\ \hline x = 28 \end{array}$$

2. Evaluate (and show your work):

$$\begin{aligned} & [(-3)^2 + 4](5 - 8) + [(-3) + 9]^2 [(-3) + 12] \\ & (9 + 4)(-3) + 6^2(9) \\ & 13(-3) + 36(9) \\ & -39 + 324 \\ & 285 \end{aligned}$$

3. What is this quadrant?



- A. 1
- B. 2
- ☒ C. 3
- D. 4

4. Solve for x : $6x - 2 + 4x + 8 = 24 - 2x$

$$8x - 2 + 8 = 24 - 2x$$

$$\begin{array}{r} 8x + 6 = 24 - 2x \\ +2x \quad +2x \end{array}$$

$$\begin{array}{r} 10x + 6 = 24 \\ -6 \quad -6 \end{array}$$

$$\frac{10x}{10} = \frac{18}{10} = x = 1.8$$

5. A developer is expanding a square lot by 25 on one side and shortened by 15 on the other. What is the new size?

	$x + 25$	
x	x^2	$25x$
-		
15	$-15x$	-375

$$x^2 + 25x - 15x - 375$$

$$x^2 + 10x - 375$$

6. Take out a common factor re trd

$$r(e+d)$$

7. Distribute: $35(-3a + 14)$

$$35(-3a) + 35(-14)$$

$$-105a + -490$$

8. $(x^2 + 3x + 2)(x + 6)$

	$x^2 + 3x + 2$		
x	x^3	$3x^2$	$2x$
+			
6	$6x^2$	$18x$	12

$$x^3 + 3x^2 + 2x + 6x^2 + 18x + 12$$

$$(x^3 + 9x^2 + 20x + 12)$$

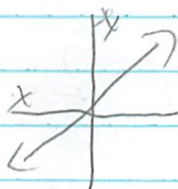
9. Solve for r in terms of s $4r + 5s + 2 = 8r - 5 + 7$

$$\begin{aligned} & \quad -5s \quad -5s \\ 4r + 2 &= 8r - 6s + 7 \\ & \quad -2 \quad -2 \\ 4r &= 8r - 6s + 5 \\ & -8r \quad -8r \\ 12r &= -6s + 5 \end{aligned}$$

$$r = \frac{-6s + 5}{12}$$

10. True or false - Slope is the steepness of a line

11. What is this



- a. positive slope
- b. no slope
- c. 0 slope
- d. negative slope

12. Short Answer: What is the difference between 0 slope and no slope.

0 slope is a vertical line, No slope is a horizontal line

13. Find the equation of the line and graph it.

In	Out
-3	-21
-1	-11
2	4
5	19

13.4

115

$$Ax \frac{15}{3} = 5x + b$$

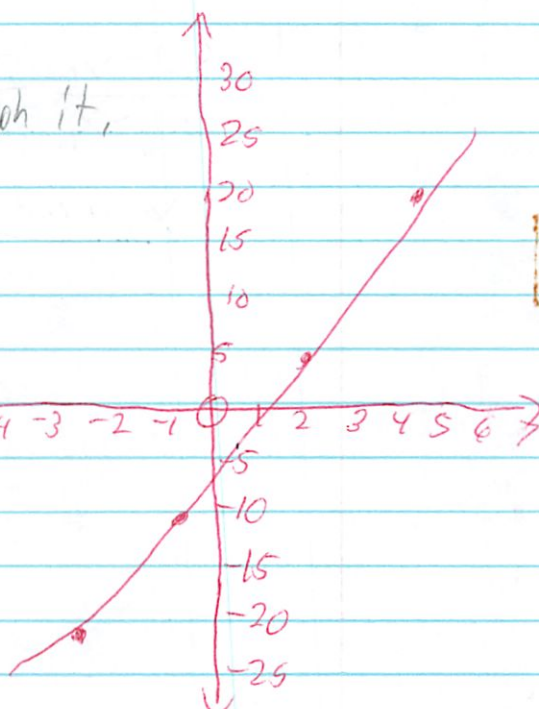
$$4 = 2(5) + b$$

$$4 = 10 + b$$

$$-10 = -10$$

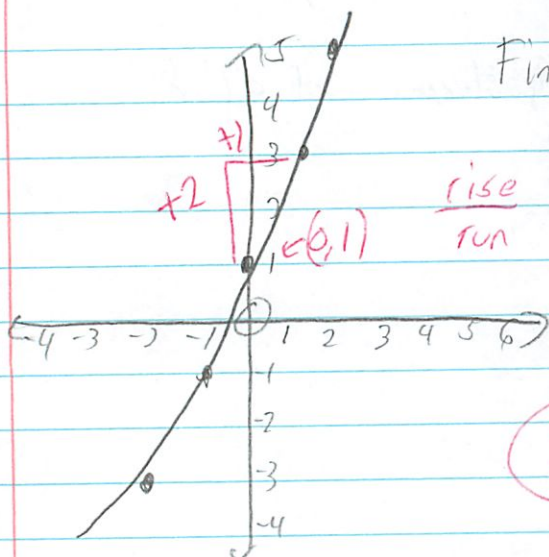
$$-6 = b$$

$$y = 5x - 6$$



Cont

14,



Find slope graphically

$$\frac{\text{rise}}{\text{run}} = \frac{2}{1} = 2x$$

$$b = 1$$

$$y = 2x + 1$$

15. Find slope with 2 point method

$$(7, 5) \quad (-3, -5)$$

$$\frac{y_2 - y_1}{x_2 - x_1} = \frac{-5 - 5}{-3 - 7} = \frac{-10}{-10} = 1$$

x intercept

$$5 = 7(1) + b$$

$$y = x - 2$$

$$5 = 7 + b$$

$$-7 \quad -7$$

$$-2 = b$$

Math 7

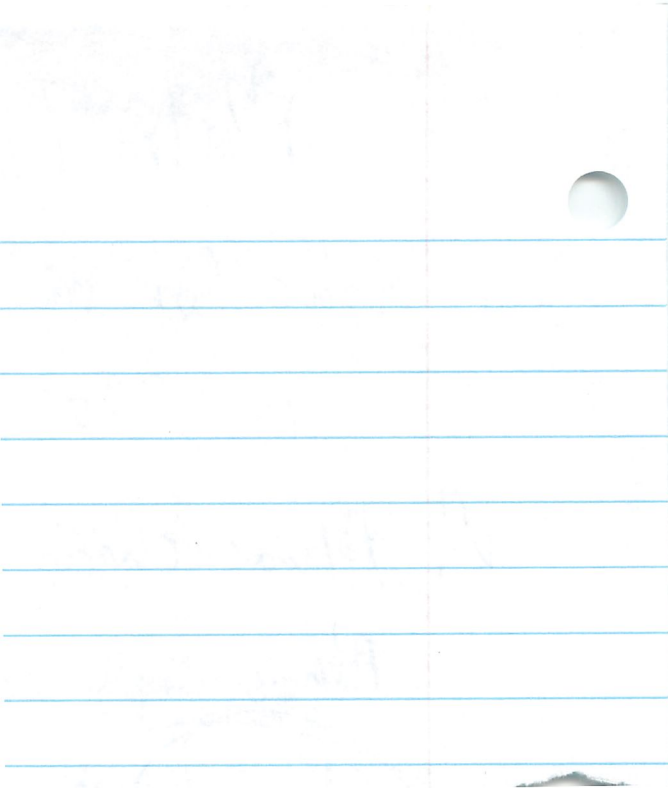
Solve for m

$$m = 115$$

✓ Always check

Always copy





Name Michael Plasmeier
 IAG 2-H
 Miss Behl
 November 21st, 2005

$$\frac{126.5}{131} + 2$$

$$\frac{128.5}{131}$$

98%

Solve-It Unit Test

Directions: Solve each of these equations for x. Be sure to show all of your work!

1. $\frac{1}{3}x + 6 = -8$

$$\frac{1}{3}x - 6 - 6$$

$$\frac{1}{3}x = -14$$

$$x = -42$$

2. $8x - (6x - 3) = 9$

$$8x - 6x + 3 = 9$$

$$2x = 6$$

$$x = 3$$

3. $2 - 7(x - 1) = 3(x - 2) - 5(d + 3)$

$$2 - 7x + 7 = 3x - 6 - 5d - 15$$

$$-7x + 9 = 3x - 5d - 21$$

$$-3x - 3x$$

$$-10x + 9 = -5d - 21$$

$$-10x = -5d - 30$$

$$x = \frac{-5d - 30}{-10} \text{ or } x = .5d + 3$$

Directions: Multiply these binomials to find an equivalent expression. Be sure to show all of your work!

4. $(x + 4)(x - 9)$

$$x(x) + x(-9) + 4(x) + 4(-9)$$

$$x^2 - 9x + 4x - 36$$

$$x^2 - 5x - 36$$

5. $(2x - 2)(x + 7)$

$2x(x) + 2x(7) - 2(x) - 2(7)$

$2x^2 + 14x - 2x - 14$

$-1 (2x^2 + 12x - 14)$ *Doh!*

6. $(x + 2)(x^2 + 3x + 1)$

$x(x^2) + x(3x) + x(1) + 2(x^2) + 2(3x) + 2(1)$

$x^3 + 3x^2 + 1x + 2x^2 + 6x + 2$

$(x^3 + 5x^2 + 7x + 2)$

Directions: Given these expressions determine what two factors were multiplied together in order to get them.

7. $x^2 - 14x + 48$

$(x - 8)(x - 6)$

$\rightarrow x$ is always there just because

8. $x^2 + 2x - 35$

$(x + 7)(x - 5)$

9. $x^2 - 81$

$(x + 9)(x - 9)$

Difference of squares

Directions: Factor out the largest common term from these expressions.

10. $431x + 11xy$

$x(431 + 11y)$

11. $27bg - 36bu + 63bq$

$9b(3g - 4u + 7q)$

12. $10ms + 30mc + 50mhc + 70mw$

$10m(s + 3c + 5hc + 7w)$

Directions: Use the distributive property to find an equivalent expression for each of these terms. Simplify them to the lowest possible answer.

13. $2x + 7(x+1) - 4x$

$2x + 7x + 7 - 4x$

$(5x + 7)$

14. $-8 + 4x - (x + 5)$

$-8 + 4x - x - 5$

$(-13 + 3x)$

15. Solve this equation for x in terms of y

$9x - 5 + 8y = 9y + 4x - 12$

$9x - 5 = y + 4x - 12$

$9x = y + 4x - 7$

$\frac{5x}{5} = \frac{y-7}{5}$

$x = \frac{y-7}{5}$

16. Solve this equation for b in terms of c

$$-15c + 7 - 5b + 18c = 16b + 14 - 3c$$

$$\begin{array}{r} 3c + 7 - 5b = 16b + 14 - 3c \\ -3c \end{array}$$

$$\begin{array}{r} 7 - 5b = 16b + 14 - 6c \\ -16b \end{array}$$

$$\begin{array}{r} 7 - 21b = 14 - 6c \\ -7 \end{array}$$

$$-21b = 7 - 6c$$

$$b = \frac{7 - 6c}{-21}$$

$$\text{or } b = -\frac{1}{3} + \frac{2}{7}c$$

17. Larry had just purchased a new satellite cell phone package. Larry's phone works anywhere in the world, and therefore is very expensive. Larry pays a flat rate of \$150 a month just to have the phone plus an additional charge of \$3 per minute for all of his calls.

- a. Accounting for all of his costs, what would be his total cost if Larry used his phone for 100 minutes in month one?

$$y = 3x + 150$$

$$y = 3(100) + 150$$

$$y = 300 + 150$$

$$y = 450$$

- b. Accounting for all of his costs, what would be his total cost if Larry used his phone for 220 minutes in month two?

$$y = 3x + 150$$

$$y = 3(220) + 150$$

$$y = 660 + 150$$

$$y = 810$$

- c. Write a rule for the above situation. Define your variables.

$$y = 3x + 150$$

y = total monthly bill

x = minutes used in a month

- d. How many minutes did Larry use if his total cost in month three was \$951?

$$y = 3x + 150$$

$$\begin{array}{r} 951 = 3x + 150 \\ -150 \end{array}$$

$$\begin{array}{r} 801 = 3x \\ \underline{3} \quad \underline{3} \end{array}$$

$$267 = x$$

267 minutes

18. What is the standard linear equation form?

$$y = mx + b$$

19. Define slope (both definitions)

Steepness of the line
- angle of the line relative to horizontal axis (x)
rate of change

20. Define y-intercept

Point where the line crosses the vertical (y) axis
- (0, y)

21. Write an equation for the line that has a slope of 4 and the y-intercept (0,0)

$$y = 4x + 0 \text{ or } y = 4x$$

22. Find the slope and y-intercept in the following equation

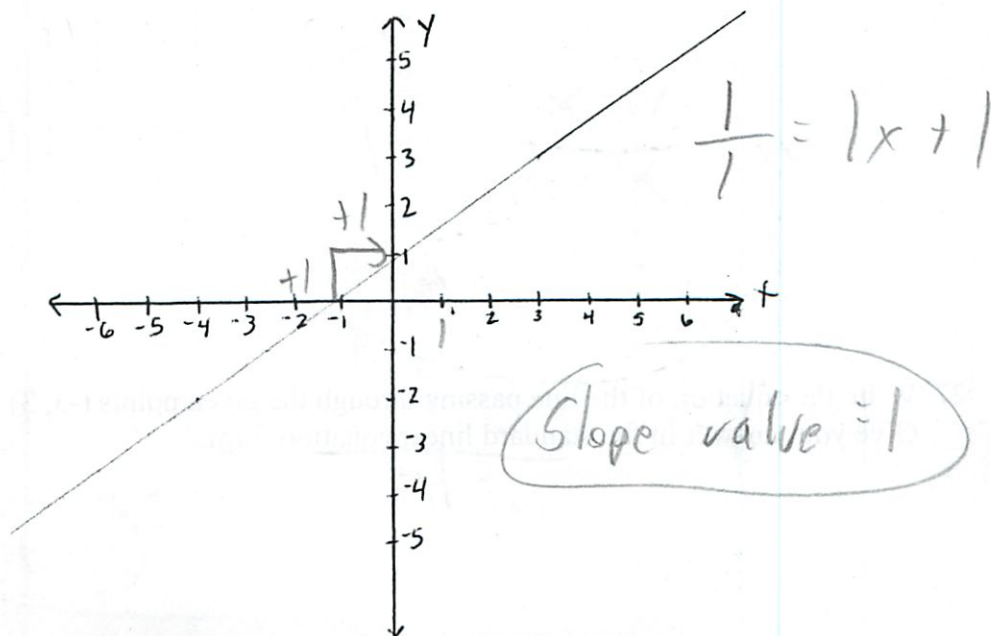
$$5x + 2y = -6$$

$$\begin{aligned} -5x & \quad -5x \\ \frac{2y}{2} &= \frac{-5x - 6}{2} \end{aligned}$$

$$y = -2.5x - 3$$

Slope value = -2.5
y-intercept point = (0, -3)

23. Find the slope of this line by using the rise and run method. Be sure to show all of your work!



24. Find the slope of the line that passes through the points (10, 10) and (-2, -5) by using the 2-Point formula.

$$\frac{y_2 - y_1}{x_2 - x_1} = \frac{-5 - 10}{-2 - 10} = \frac{-15}{-12} = \frac{15}{12} = \frac{5}{4}$$

slope value = $\frac{5}{4}$

25. Use the coordinate pairs (-2, 6) and (4, -8) to answer part a-d

a. Plot the points on a coordinate grid and draw a line through them

b. Find the slope of the line

slope value = $-\frac{7}{3}$

c. Find the y-intercept on the line.

y-intercept point = $(0, 1\frac{1}{3})$

d. Write the equation for this line

$$y = -\frac{7}{3}x + \frac{4}{3}$$

pos, neg
neg

26. A line has a slope of 6 and passes through the point (2, 2). Find the equation for this line. Be sure to show ALL of your work!

$$y = 6x - 10$$

$$\frac{y_2 - y_1}{x_2 - x_1} = \frac{3 - 3}{-1 - 3} = \frac{0}{-4} = 0$$

$$3 = 0(-1) + b$$

$$3 = 0 + b$$

$$3 = b$$

27. Write the equation of the line passing through the given points (-3, 3) and (-1, 3). Give your answer in the standard linear equation form.

$$3 = b$$

$$y = 0x + 3$$

or $y = 3$

Name
Period
Date

Michael Plasmor

Do Bees Build it Best? Notebook Index

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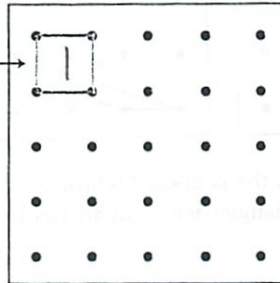
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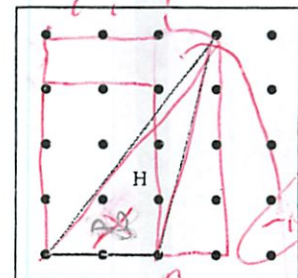
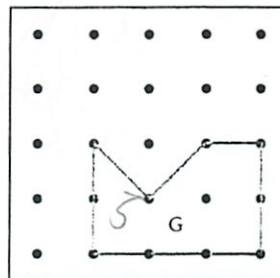
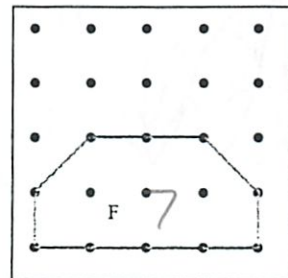
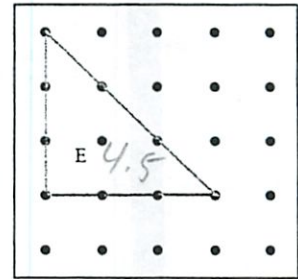
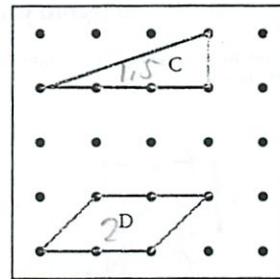
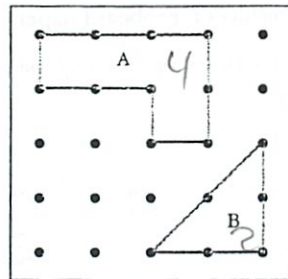
Nailing Down Area

Unit
of
Area



In this activity, the unit of area will be the smallest square on the geoboard, such as the one shown here.

1. Construct each of figures A through L on your geoboard and find their areas. Record your results.



say
like
this
4 units²

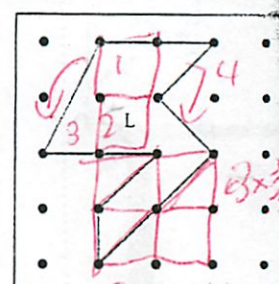
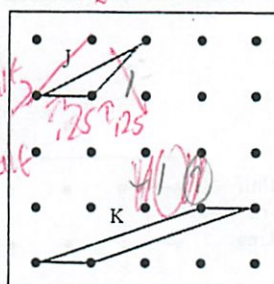
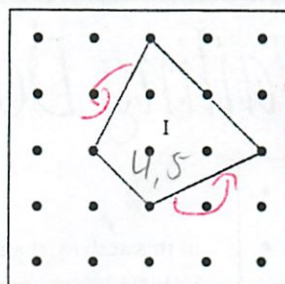
16
1/2 of 4
empt (-4)
9 (-4.5)

Continued on next page

$$16 - 4.5 - 4 - 1.5 = 4$$

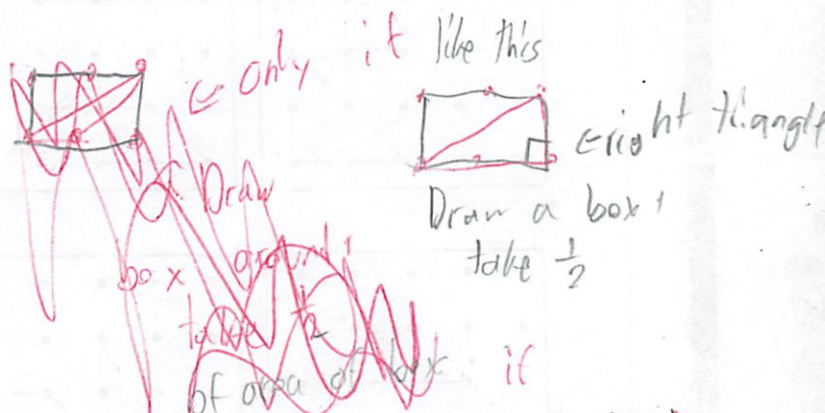
Do Bees Build It Best?

Classwork



2. Create triangles on the geoboard whose area is half a unit. Find as many different-shaped triangles with this area as you can and record your results on geoboard paper.
3. Create quadrilaterals (four-sided figures) on the geoboard whose area is exactly 1 unit. Find as many different-shaped quadrilaterals with this area as you can and record your results on geoboard paper.

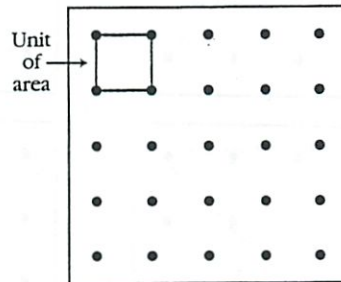
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Homework

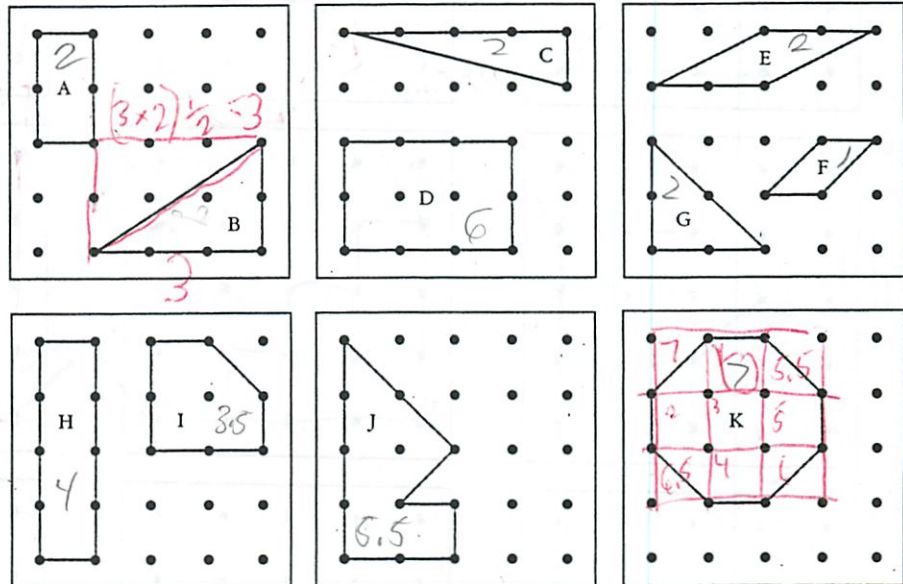
Do Bees Build It Best?

Homework 3 How Many Can You Find?



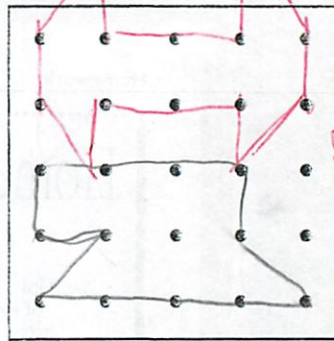
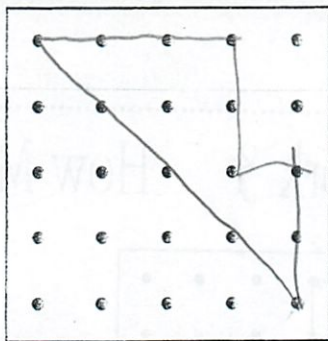
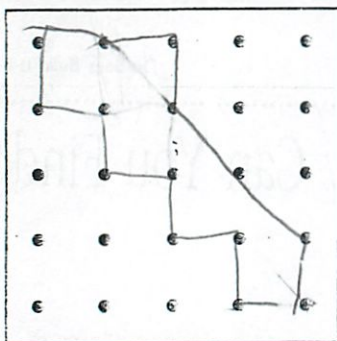
As in *Nailing Down Area*, the unit of area in this assignment is the basic square on the geoboard, such as the one shown here.

1. Find the area for each of figures A through K.

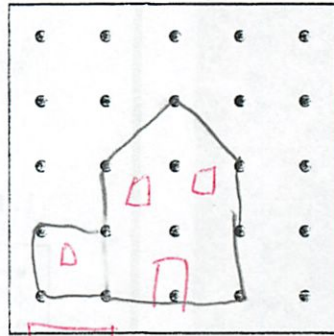
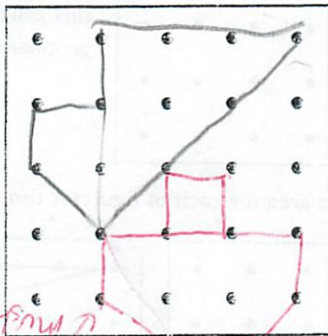
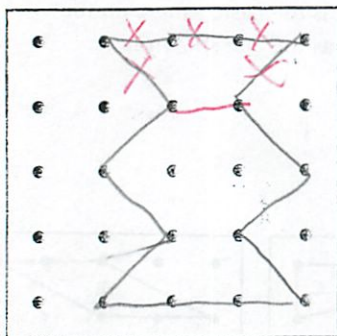


2. Draw polygons on geoboard paper whose areas are 6 units. Find as many different shapes as you can. (You'll probably be better able to find a lot of shapes if you organize your list in some way.)

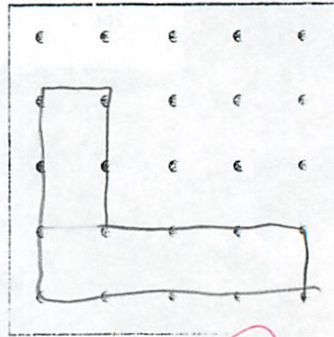
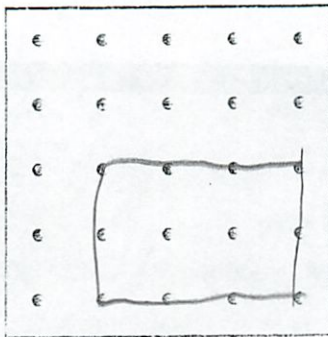
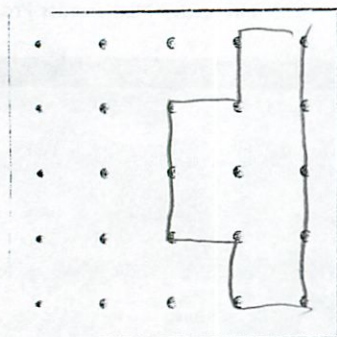
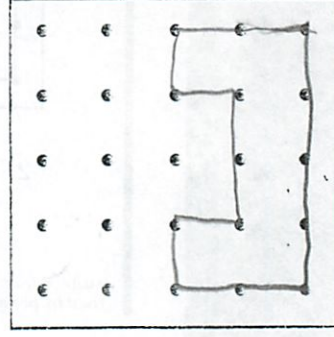
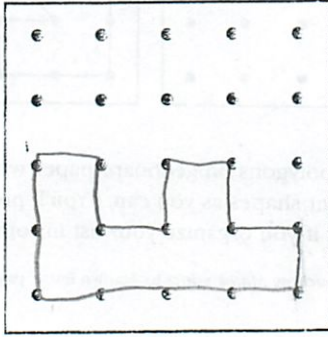
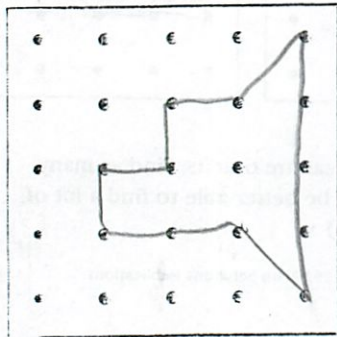
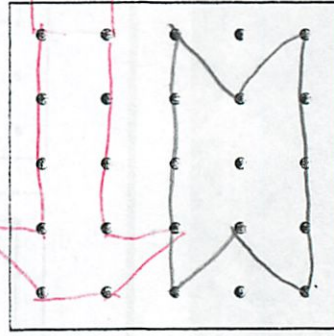
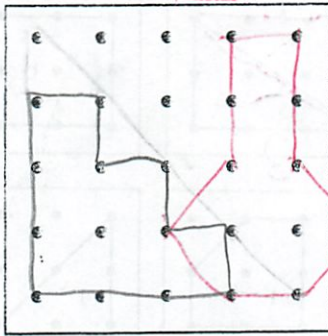
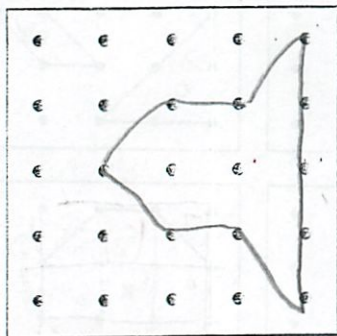
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Star Wars
X-wing



Loop room



Flip

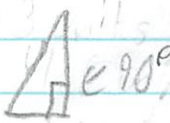
Michael Plummer
Behl
TAG 2119
5 Dec 2005

Triangle Notes (Altitude/Height)

③

12/5

Triangles we study

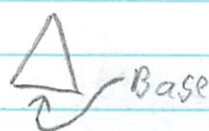
- Right triangle 

- Obtuse triangle

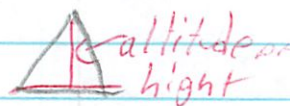
 any triangle w/ $> 90^\circ$ angle

- Acute triangle  a triangle that has all < 90 angles

Base - the horizontal side



Altitude - a perpendicular (when lines form at 90° angles) line segment from a vertex of a triangle to the line containing the opposite side

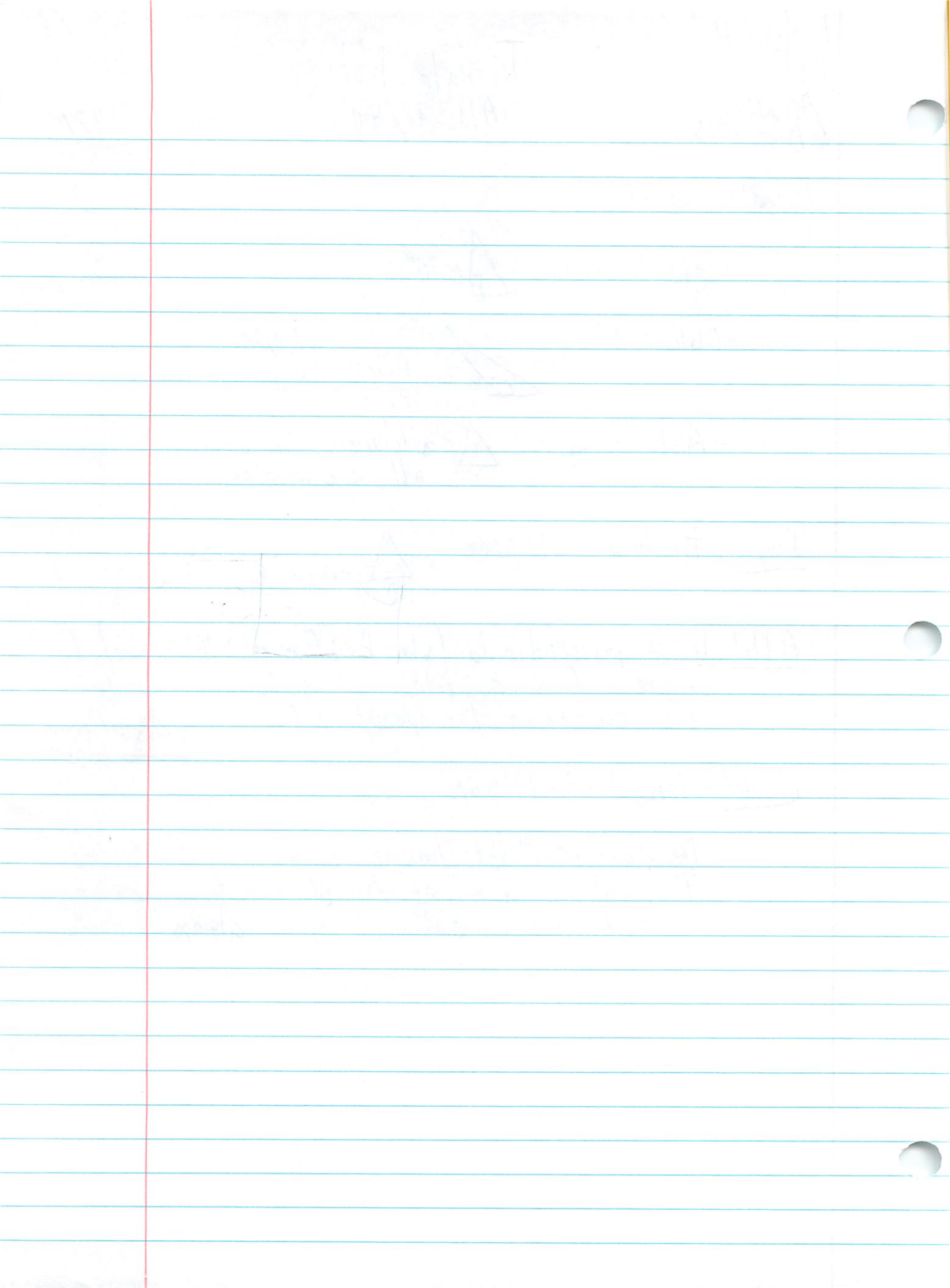


Height - length of altitude

The height of Right Triangle is one of the sides

The height of an acute triangle is always inside it.

The height of an obtuse triangle is always outside it.



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IAC 2119
5 Dec 2005

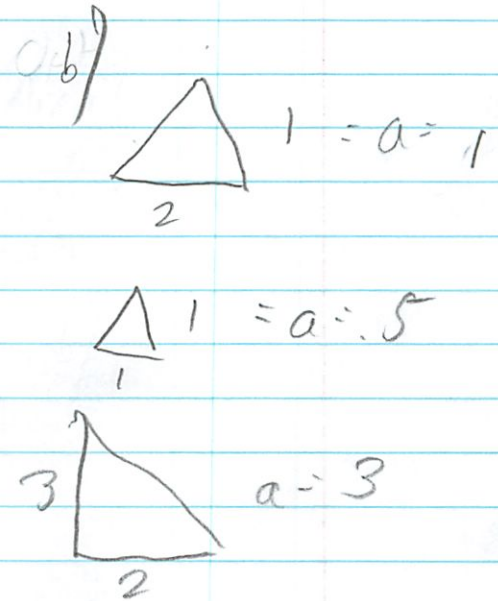
Ings + Outs of Area (6)

(4)

12/5

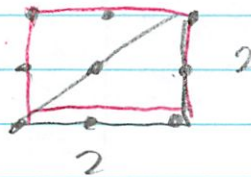
1.

In		Out
Base	Height	Area
1	3	1.5
3	3	4.5
4	2	4
4	1	2
2	4	4
1	3	1.5
2	1	



C: formula = $\frac{1}{2}(b \times h)$ or $\frac{b \times h}{2}$

2. A triangle can be drawn in a box



When you draw it in a box you get a 2×2 area. The triangle takes up half of this so $\frac{1}{2}(b \times h)$

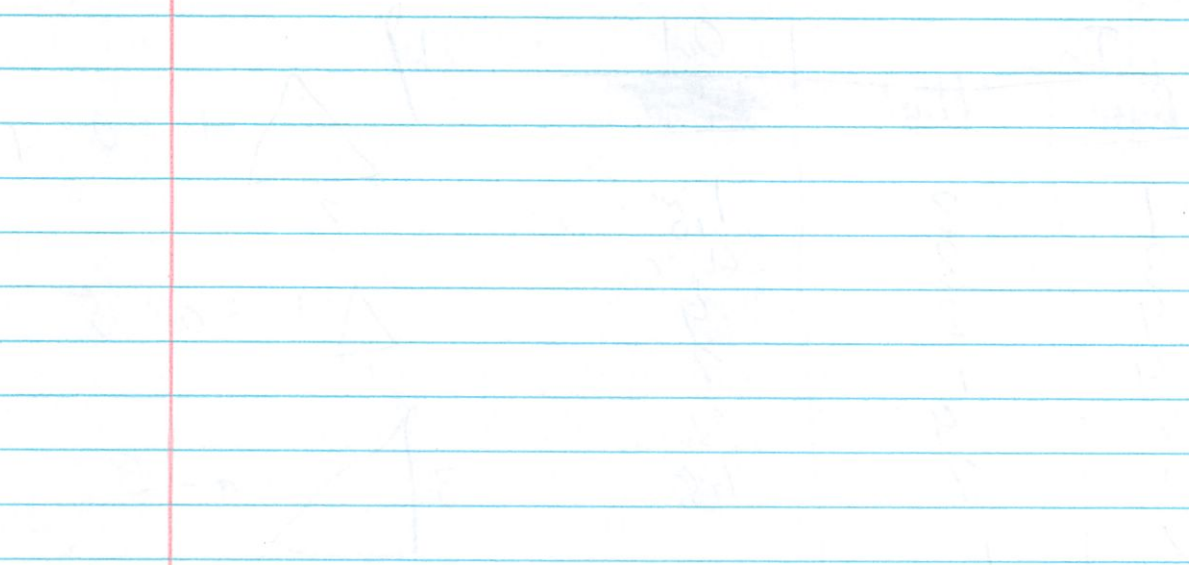
but why does it work for this



$2 = a = 1$ Any triangle can be inscribed in a rectangle/square. It takes up half of the rectangle/square

2019-2020

2019-2020



2019-2020

2019-2020

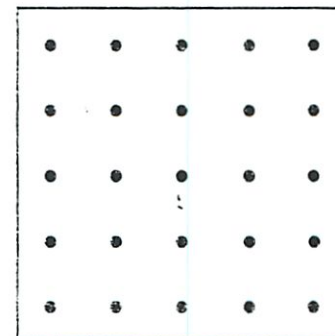
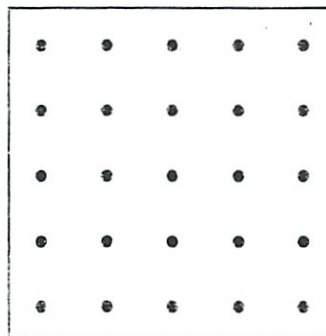
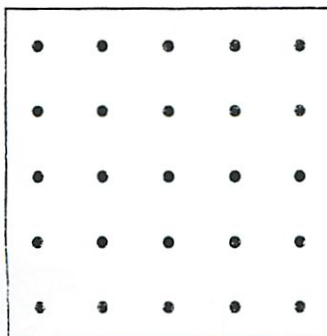
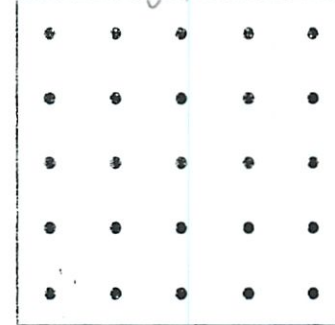
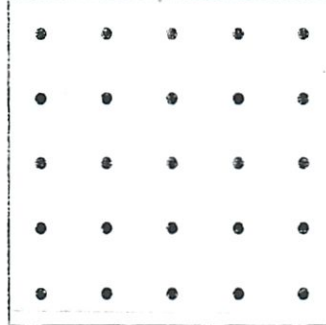
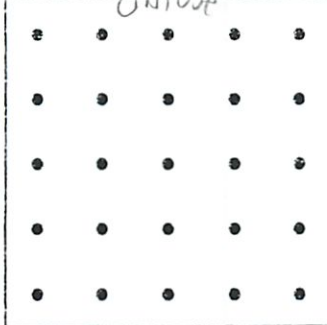
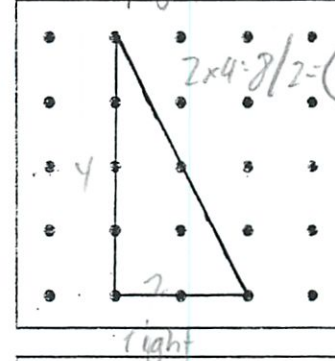
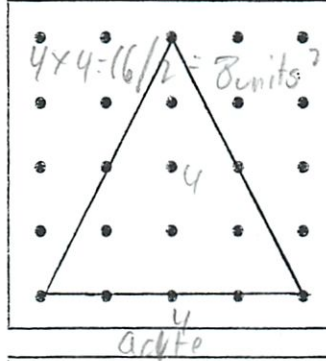
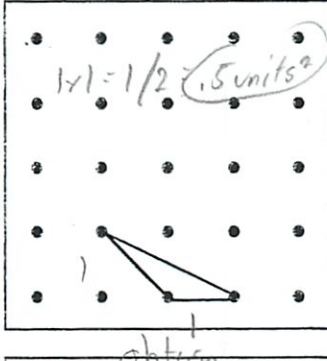
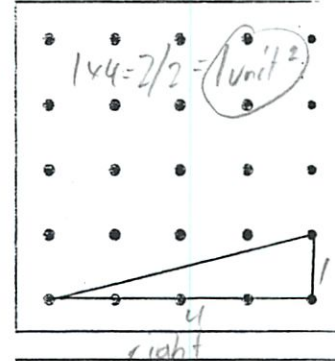
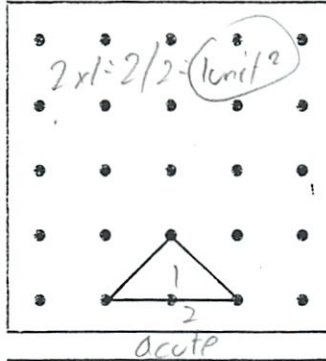
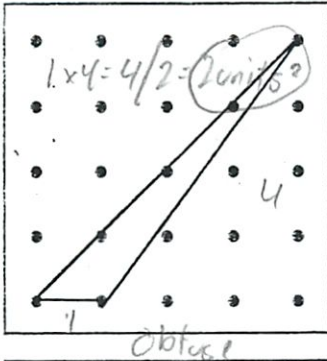
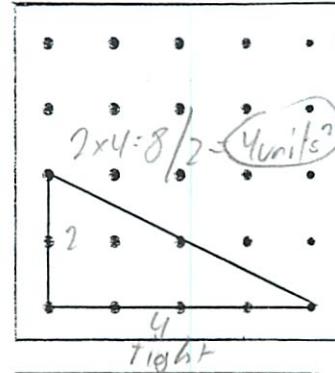
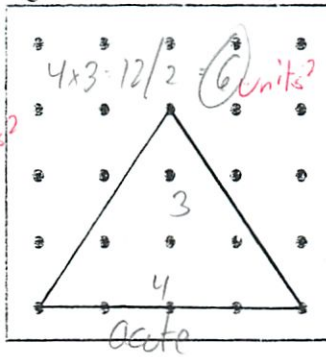
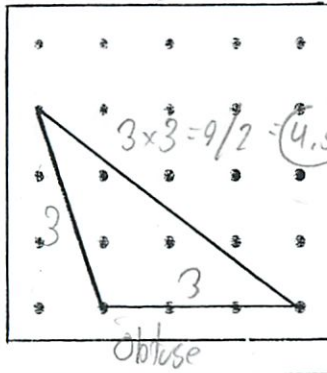
2019-2020



2019-2020

2019-2020

Directions: Find the height and base of each triangle. Make a conclusion about the height of triangle for an obtuse, right, and isosceles triangle.



Michael Plasmeier
Behl
TAG2 H9
7 Dec 2005

Pattern Blocks

12/7



- Parallelogram

- quadrilateral (4 sided-shape)
- opposite sides are parallel + equal lengths
- 2 obtuse angles + 2 acute angles



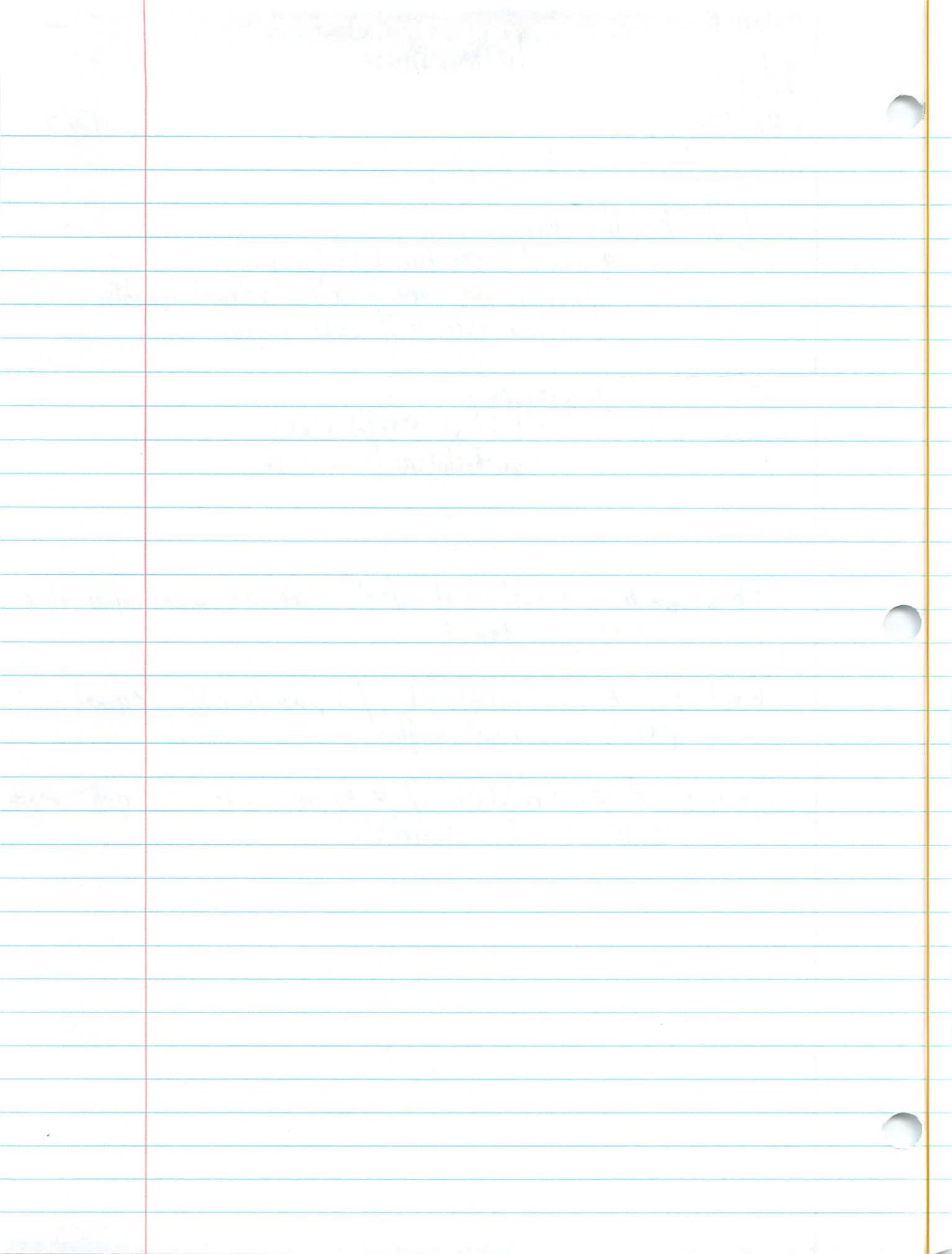
- Trapezoid

- 1 set of parallel sides
- quadrilateral (4 sided-shape)

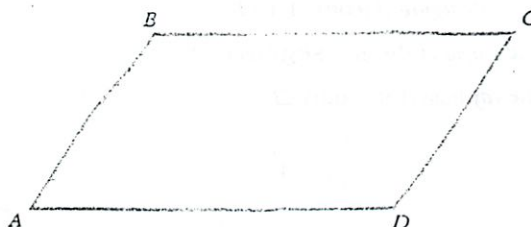
Rhombus - A quadrilateral w/ all opposite sides parallel + all 4 sides =

Rectangle - A quadrilateral w/ opposite sides, equal and parallel, 4 right angles

Square - A quadrilateral w/ 4 equal sides + 4 right angles opposite sides parallel

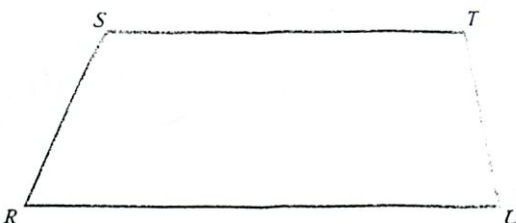
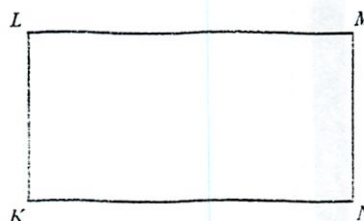


Parallelograms and Trapezoids



A **parallelogram** is a quadrilateral (a four-sided figure) in which both pairs of opposite sides are parallel. For example, in quadrilateral $ABCD$ shown here, $\overline{AB}$ is parallel to $\overline{CD}$ and $\overline{BC}$ is parallel to $\overline{AD}$, so $ABCD$ is a parallelogram.

Note: A rectangle is a special kind of parallelogram in which the angles are all right angles. For example, in rectangle $KLMN$, $\overline{KL}$ is parallel to $\overline{NM}$ and $\overline{LM}$ is parallel to $\overline{KN}$, so this rectangle is also a parallelogram.



A **trapezoid** is a quadrilateral in which one pair of opposite sides is parallel but the other pair is not. For example, in quadrilateral $RSTU$, $\overline{ST}$ is parallel to $\overline{RU}$ but $\overline{RS}$ is not parallel to $\overline{TU}$, so $RSTU$ is a trapezoid.

Continued on next page

Reference

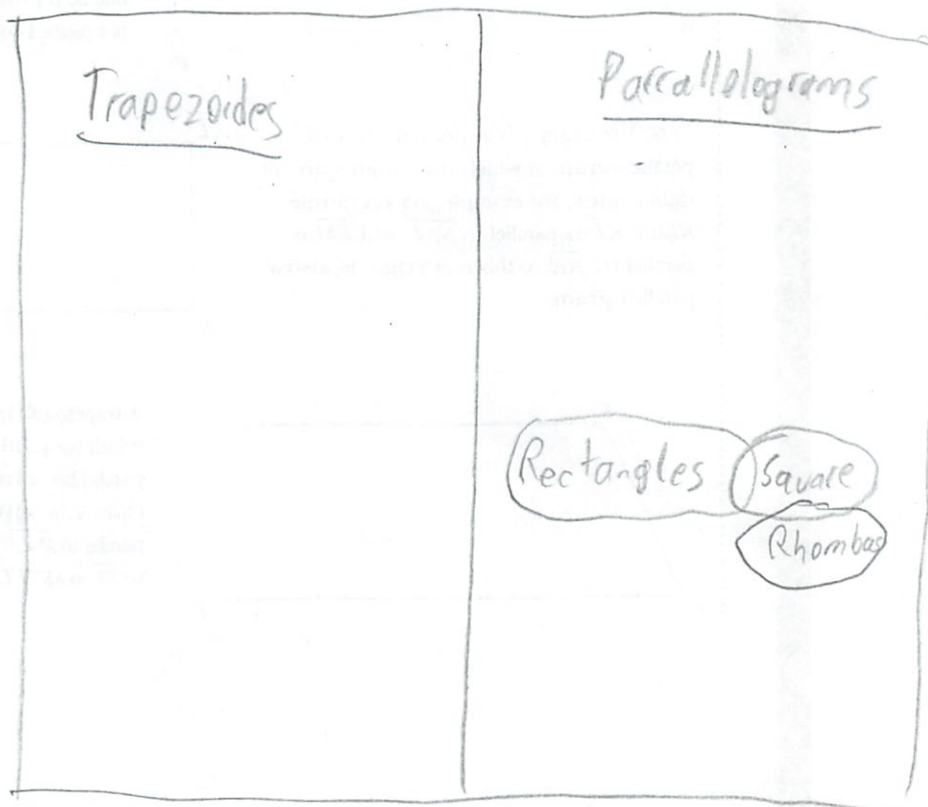
Do Bees Build It Best?

Reminder: Polygons are often named by listing their vertices sequentially. For polygons with more than three vertices, the sequence in which the vertices are named is significant and needs to reflect the way in which the vertices are connected. For instance, trapezoid $RSTU$ has other names, such as $TURS$ or $SRUT$, but it cannot be called $STRU$ because T and R are not connected by a side of the figure.

Here is a summary of other geometric notation.

- $\overleftrightarrow{AB}$ the line through two points, A and B
- $\overline{AB}$ the line segment from A to B
- AB the length of the line segment $\overline{AB}$
- $\overrightarrow{AB}$ the ray from A through B

Quadrilaterals



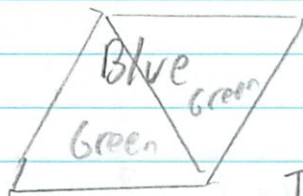
Michael Plasmeier
 Behl
 JAGZ/H9
 7 Dec 2005

Forming Formulas ⑦

⑦

12/7

1. Area of parallelogram



2 green triangles = 1 blue parallelogram

If half (base $\times$ height) is a triangle

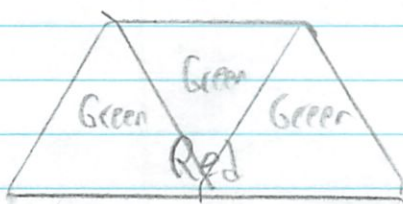
$\times \frac{1}{2} \times b \times h$ 2 would be just base $\times$ height

See worksheet for proof + correction

The formula worked

2. Area of a trapezoid

- trapezoid same though only 1 side needs to be parallel



3 green triangles fit

can't do $3(\frac{1}{2} \text{ base} \times \text{height})$
 see box 6

though can divide into smaller shapes to count

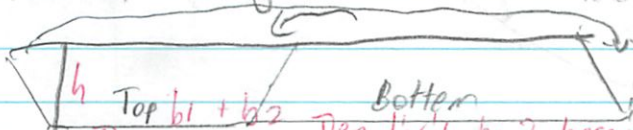
see geo board paper

parallelogram

- don't need to cut it in 2,

just add another

If I try taking off half of the top, it might work



Now it is more like a rectangle

This comes from $l \times w$ - in this case the length is the top + the bottom. However there is still the problem of the slanted sides, which can be moved. It is how a rectangle (top + bottom) $\times$ height

But this still doesn't work. However I noticed that $(\text{top} + \text{bottom}) \times \text{height}$ is half of what I found when I counted. So that means

$$\frac{(\text{top} + \text{bottom}) \times \text{height}}{2}$$

Still I don't get why you divide by 2.

Possibly because you have counted both the base + height

Possibly by that triangle that is left over

Re: it

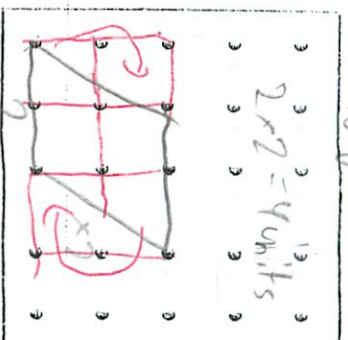
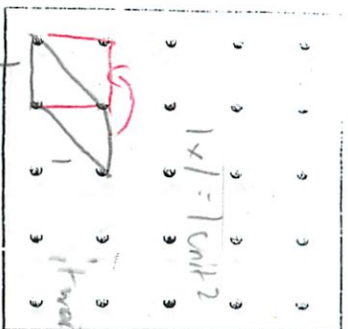
gives the adv
of the $(\text{top} + \text{bottom})$
bases

Can do

$$\left(\frac{b_1 + b_2}{2} \right) h$$

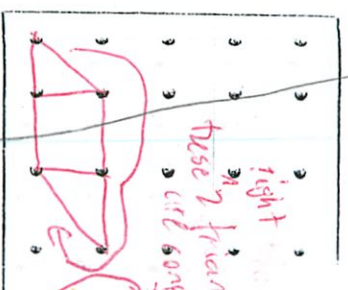
$$\frac{(b_1 + b_2)h}{2}$$

Parallelogram

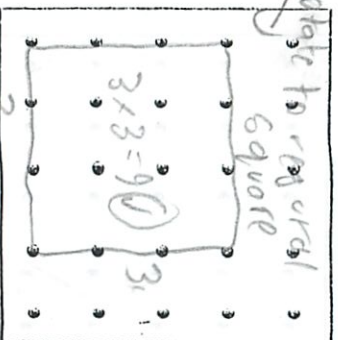
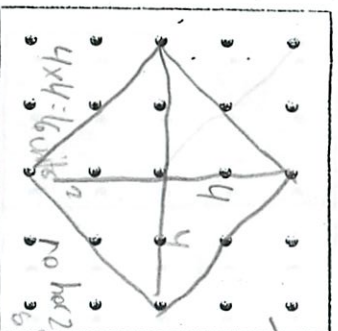


larger

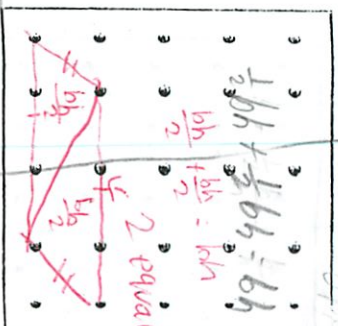
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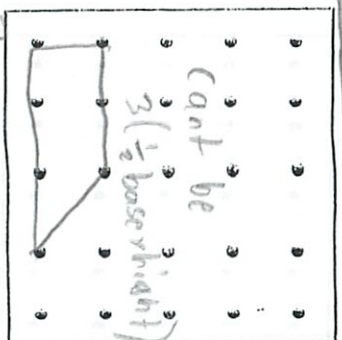
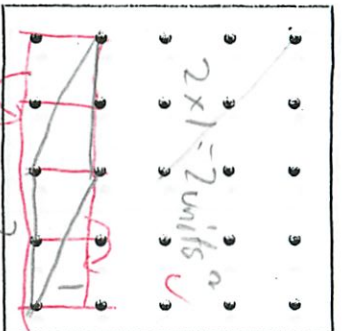
these 2 triangles are congruent so can put together to get 1 unit rectangle
b/c opposite sides are



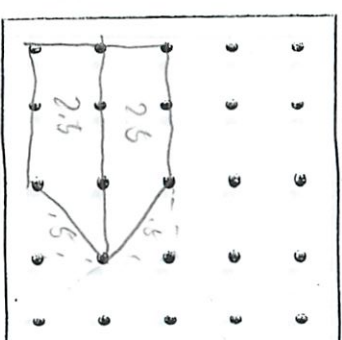
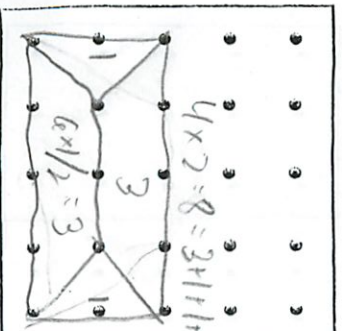
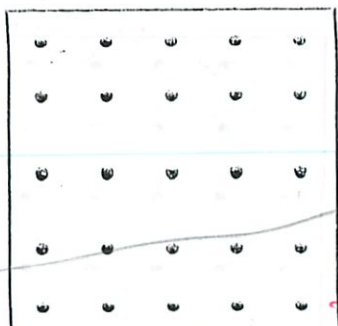
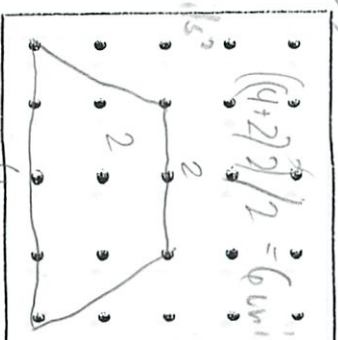
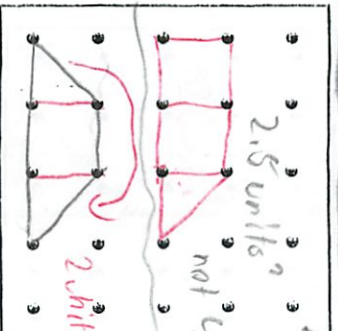
rotate to square



2 equal triangles, because sides are =



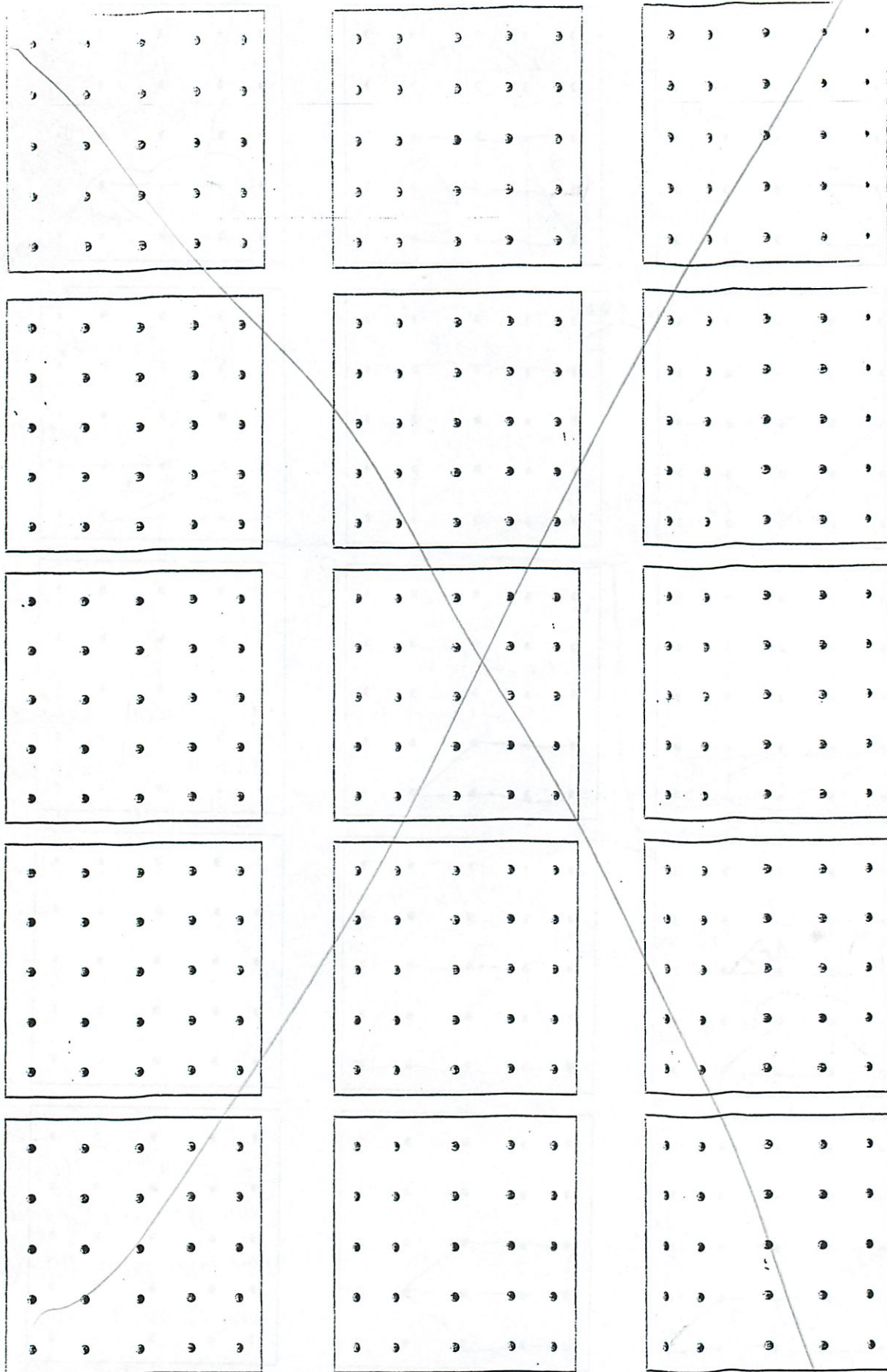
2 different bases, so take adv of 2 bases, then find area of quad. normally



If you put 2 trapezoids together you get parallelogram. The parallelogram has $(b_1 + b_2)$ as its base & has its height, so $(b_1 + b_2)h$ but only want $1/2$ so $\div 2$

Trapezoid

$$\frac{(b_1 + b_2)h}{2}$$



Finding Areas #1

Label all
units

Name Michael Plasencia
Date _____

1. What is the formula for finding the area of a triangle?

$$A = \frac{1}{2}(b \times h)$$

2. What is the formula for finding the area of a parallelogram?

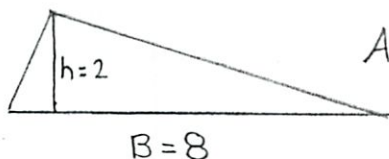
$$A = b \times h$$

3. What is the formula for finding the area of a trapezoid?

$$A = \frac{(b_1 + b_2)}{2} h$$

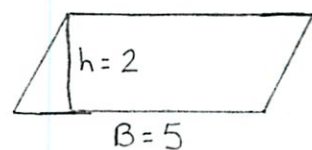
4. Find the area of these shapes by using the formulas from question #1-3.

a.



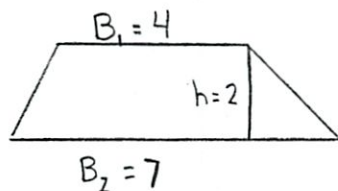
Area = 8

b.



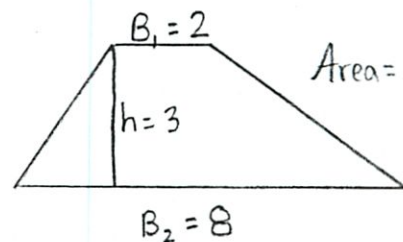
Area = 10

c.



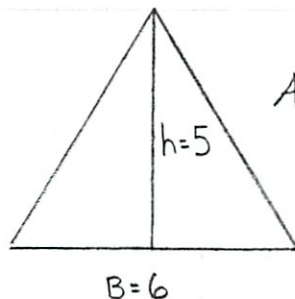
Area = 11

d.



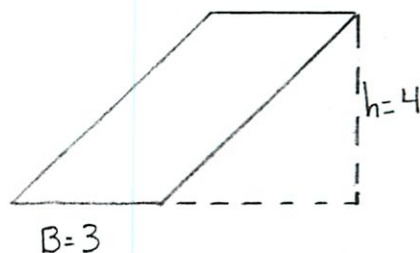
Area = 15

e.



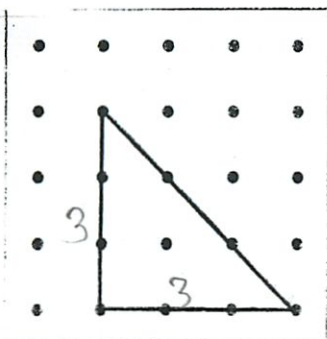
Area = 15

f.



Area = 12

5. Find the height and base for each polygon. Using those measurements compute the area for the following shapes.

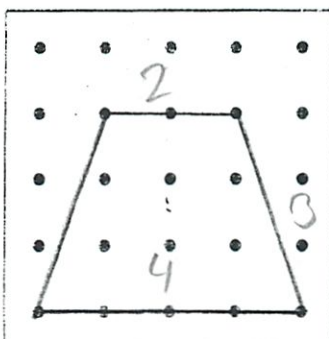


$$h=3$$

$$b=3$$

$$A=4.5 \text{ units}^2$$

b.

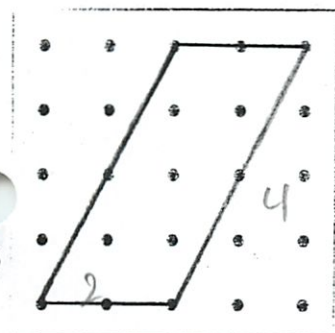


$$h=3$$

$$b=(2+4)/2=3$$

$$A=9 \text{ units}^2$$

c.

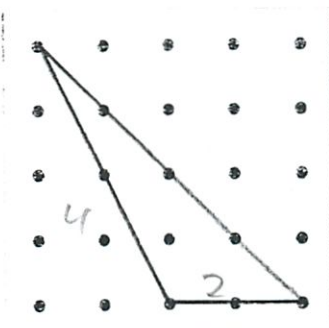


$$h=4$$

$$b=2$$

$$A=8$$

d.

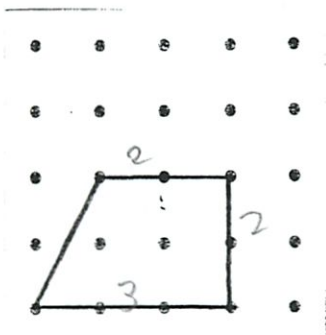


$$h=4$$

$$b=2$$

$$A=4$$

e.

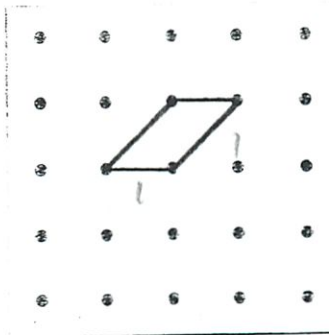


$$h=2$$

$$b=(3+2)/2=2.5$$

$$A=5$$

f.

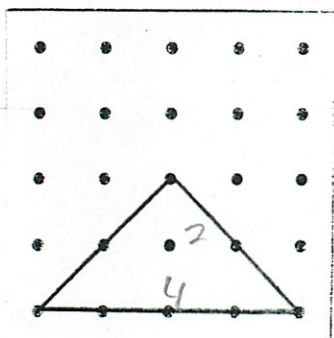


$$h=1$$

$$b=1$$

$$A=1$$

g.



$$h = 2$$

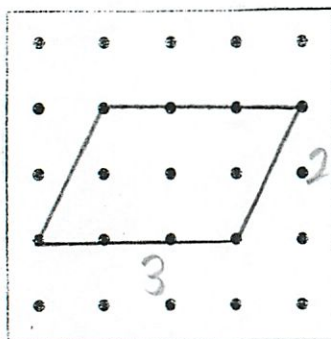
$$b = 4$$

$$A = 3$$

$$2 \times 4 = 8/2 =$$

$$4 \text{ units}^2$$

h.

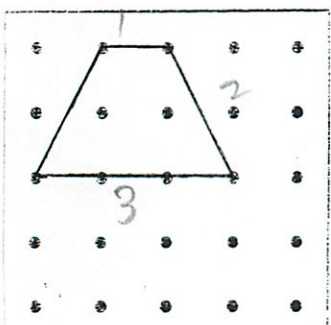


$$h = 2$$

$$b = 3$$

$$A = 6$$

i.



$$h = 2$$

$$b = (2+3)/2 = 2.5$$

$$A = 6.25$$

Michael Mosprebr
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IAG2H9
13 Dec 2005

Right Triangle Painting (8)

(9)

$$2. \frac{BC}{AB} = \frac{23}{27.5} = .8363$$

Class

$$\bar{x} = .80$$

$$\sin(55) = .819$$

$$\frac{AC}{AB} = \frac{16}{27.5} = .5818$$

$$\bar{x} = .56$$

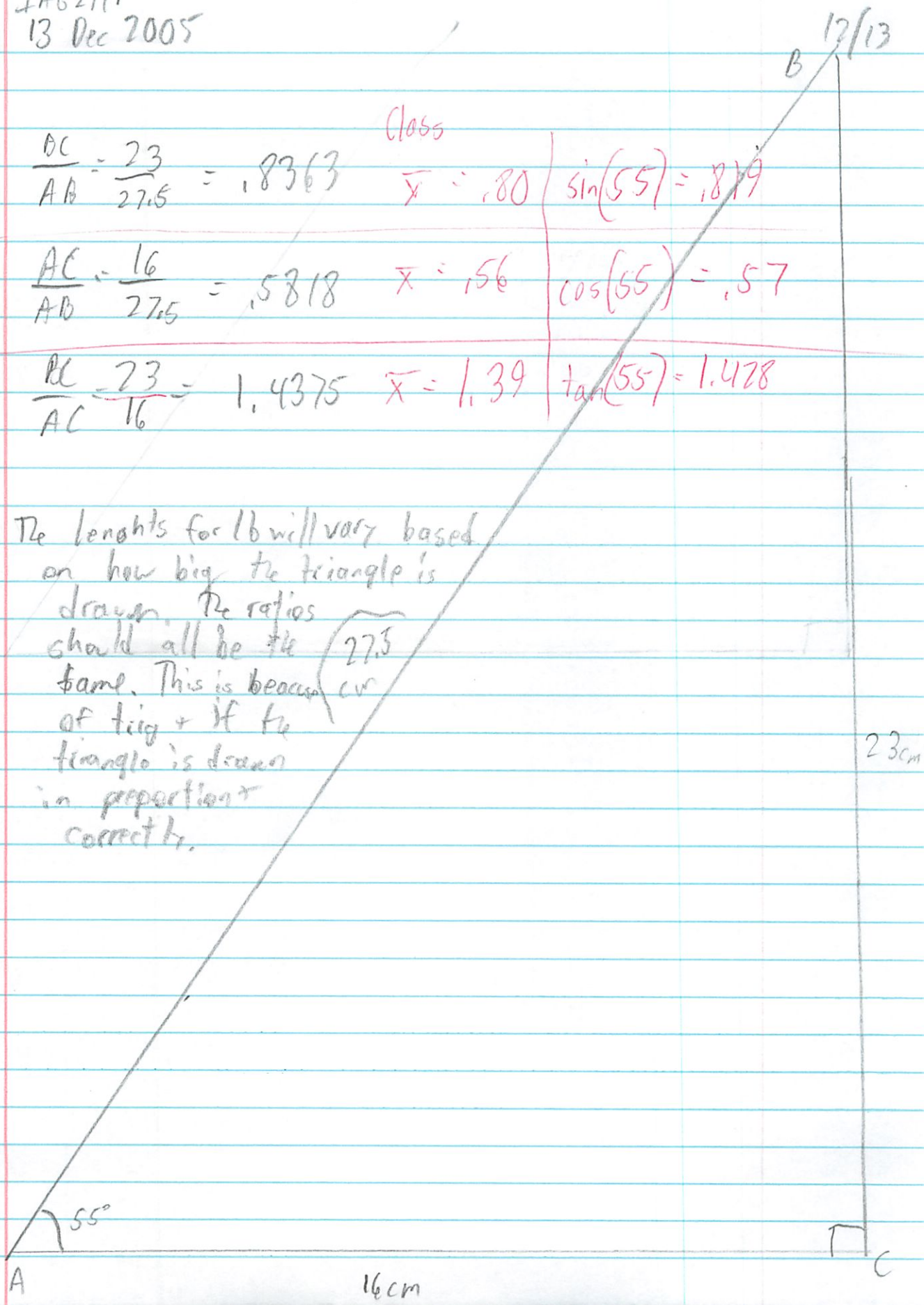
$$\cos(55) = .57$$

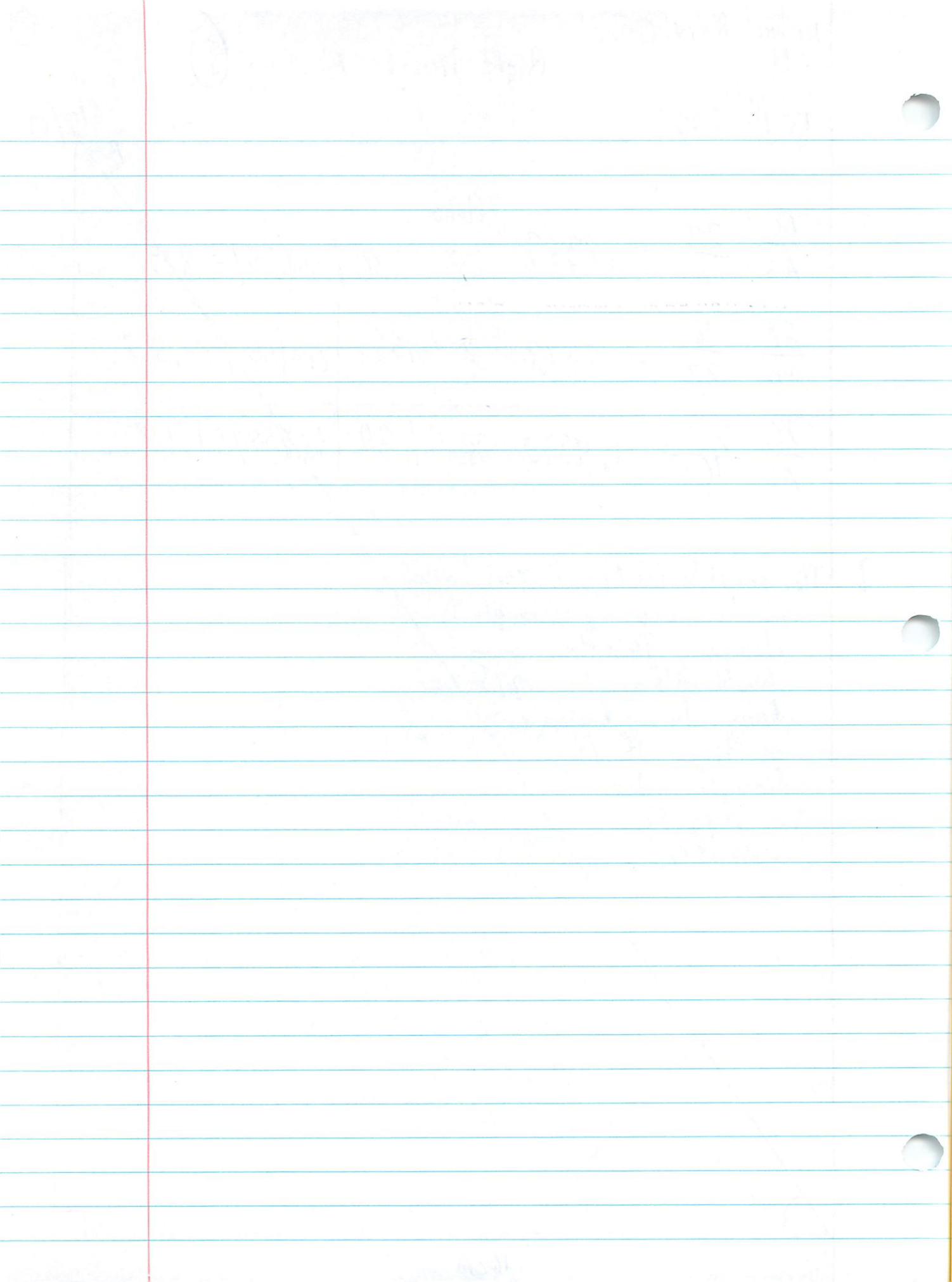
$$\frac{BC}{AC} = \frac{23}{16} = 1.4375$$

$$\bar{x} = 1.39$$

$$\tan(55) = 1.428$$

3. The lengths for lb will vary based on how big the triangle is drawn. The ratios should all be the same. This is because of trig + if the triangle is drawn in proportion + correctly.





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IAG 2H9
15 Dec 2005

Quick Area Review

(10)

Formula

1. Triangle Formula = $\frac{1}{2}(b \times h)$ $\frac{1}{2}bh$

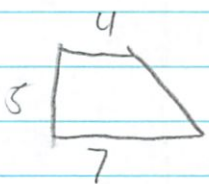
2. Parallelogram Formula = $b \times h$ bh

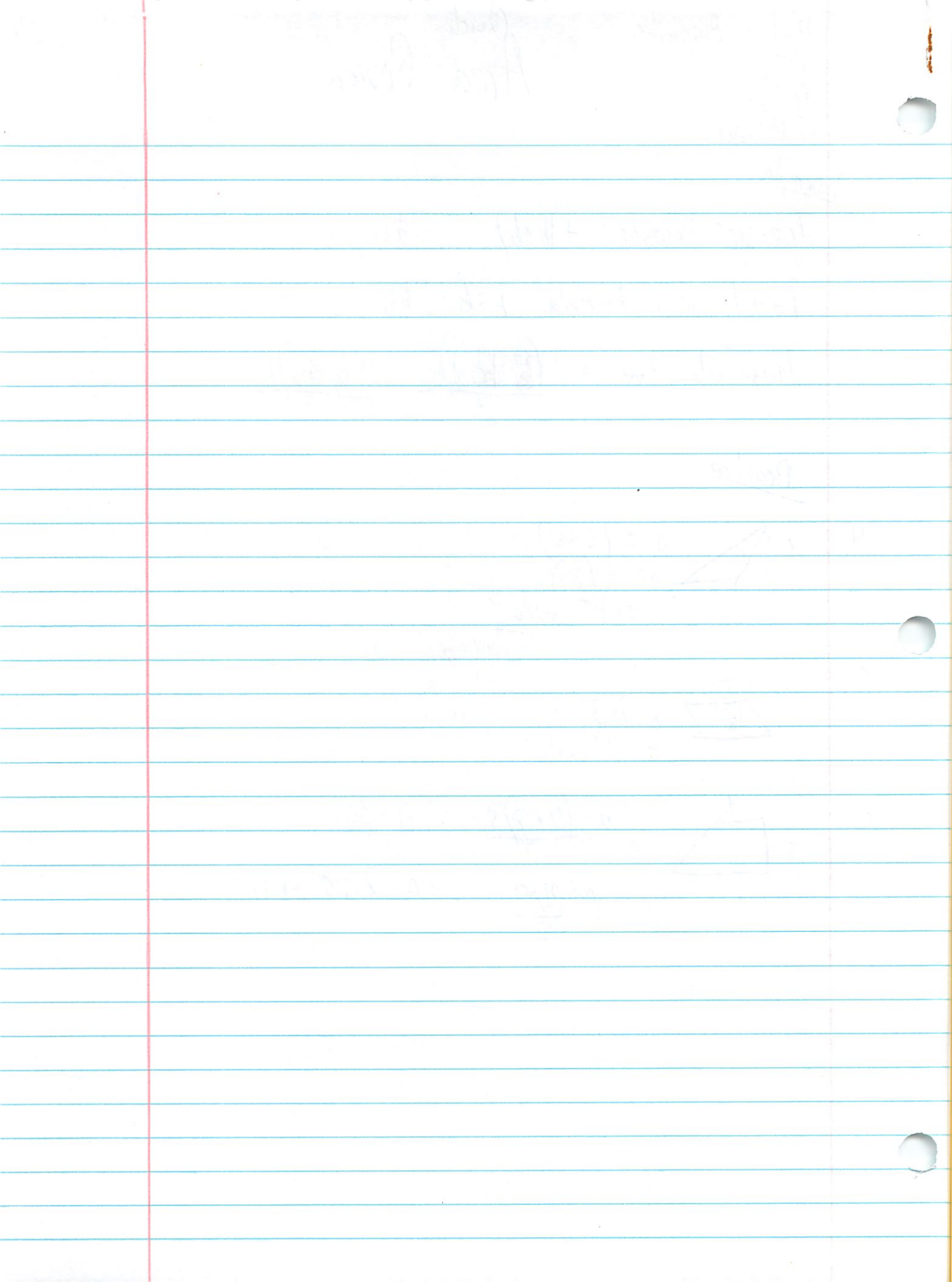
3. Trapezoid Formula = $\frac{(b_1 + b_2)h}{2}$ $\frac{(b_1 + b_2)h}{2}$

Practice

4.  $a = \frac{1}{2}(6 \times 5)$
 $a = \frac{1}{2}(30)$
 $a = 15 \text{ units}^2$
remember unit

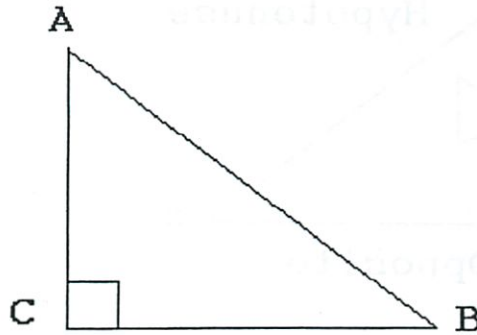
5.  $a = 7 \times 3$
 $a = 21 \text{ units}^2$

6.  $a = \frac{(4+7)5}{2}$ $a = \frac{55}{2}$
 $a = \frac{(11)5}{2}$ $a = 27.5 \text{ units}^2$



TRIGONOMETRY

(The study of the ratios of the side lengths of right triangle.)



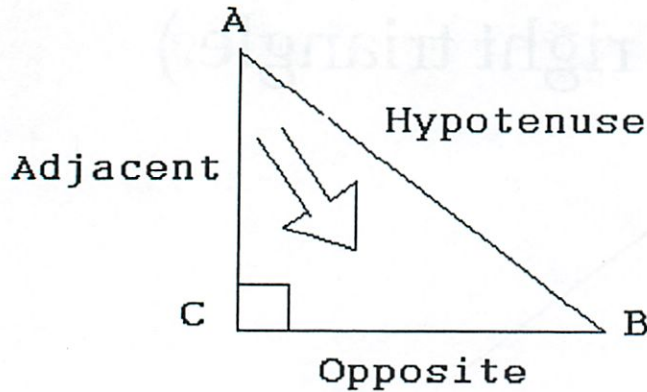
Hypotenuse = The side that is **ALWAYS ACROSS** from the right angle.

Adjacent = The side that is **next to** the angle you are "looking from"

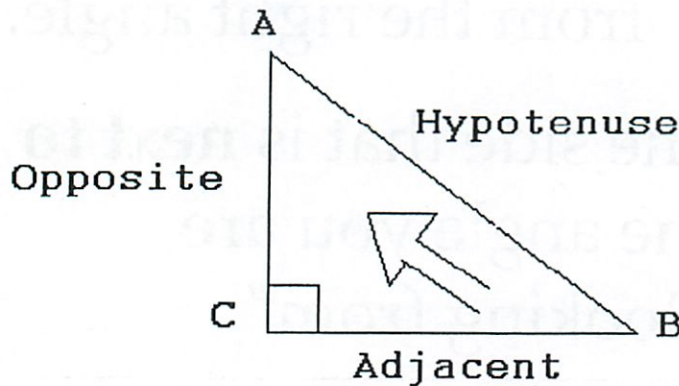
Opposite = The side that is **across** from the angle you are "looking from"

Examples:

- If you are looking from Angle A



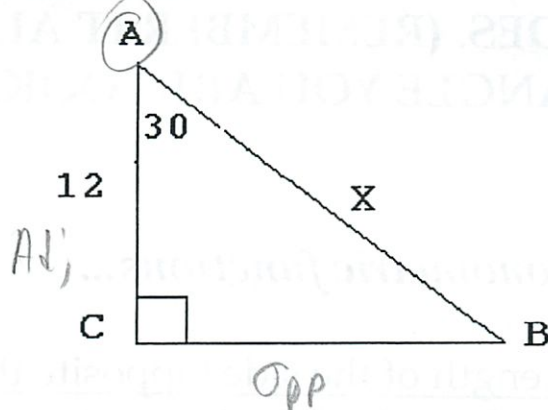
- If you are looking from Angle B



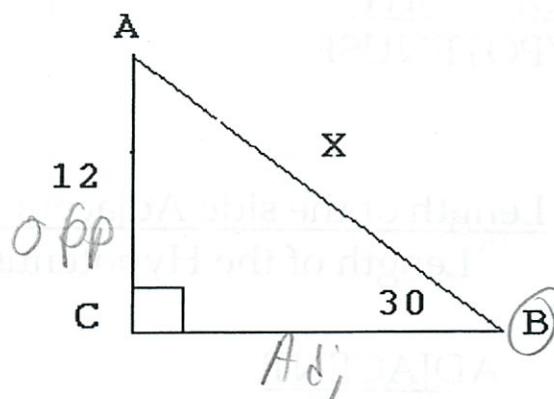
**REMEMBER IT ALL DEPENDS ON
WHAT ANGLE YOU ARE
LOOKING FROM!!!**

Practice:

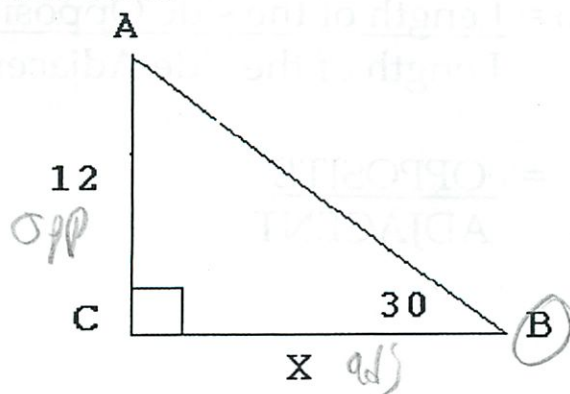
1. Relative to the angle you are given, which two sides are labeled?



2. Relative to the angle you are given, which two sides are labeled?



3. Relative to the angles you are given, which two sides are labeled?



THE TRIG FUNCTION THAT YOU WILL USE
DEPENDS ON WHICH TWO SIDES ARE
LABELED. YOU WILL ALWAYS BE GIVEN 2 OUT
OF THE 3 SIDES. (REMEMBER IT ALL DEPENDS
ON WHAT ANGLE YOU ARE LOOKING FROM)

The Three Trigonometric functions...

1. $\text{Sine } \theta = \frac{\text{Length of the side Opposite the angle}}{\text{Length of the Hypotenuse}}$

$$= \frac{\text{OPPOSITE}}{\text{HYPOTENUSE}}$$

SOH

2. $\text{Cosine } \theta = \frac{\text{Length of the side Adjacent the angle}}{\text{Length of the Hypotenuse}}$

$$= \frac{\text{ADJACENT}}{\text{HYPOTENUSE}}$$

CAH

3. $\text{Tangent } \theta = \frac{\text{Length of the side Opposite the angle}}{\text{Length of the side Adjacent the angle}}$

$$= \frac{\text{OPPOSITE}}{\text{ADJACENT}}$$

TOA

THERE ARE 3 OTHER RATIOS OF SIDE LENGTHS
WITHIN A RIGHT TRIANGLE. THESE 3 RATIOS ARE
THE RECIPROCAL OF ONE OF THE RATIOS ABOVE.

1. Cotangent $\theta = \frac{1}{\text{Tangent } \theta}$

2. Secant $\theta = \frac{1}{\text{Cosine } \theta}$

3. Cosecant $\theta = \frac{1}{\text{Sine } \theta}$

Trigonometric Ratios:

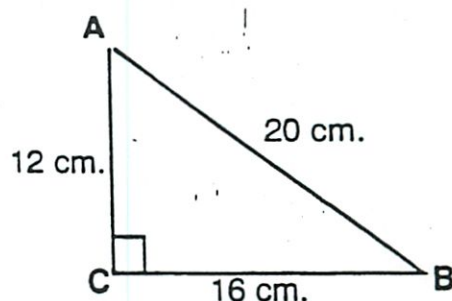
Name: Michael Placemier
Date: 1/1/ Pd:

1. State each trigonometric ratio in terms of the sides/hypotenuse of a right triangle.
(Opposite, Adjacent, Hypotenuse)

a) $\sin A = \frac{\text{opp}}{\text{hyp}}$ b) $\cos A = \frac{\text{adj}}{\text{hyp}}$ c) $\tan A = \frac{\text{opp}}{\text{adj}}$

2. Use the diagram below to find the trigonometric functions in simplest fractional form.

a) $\sin A = \frac{16}{20}$
b) $\cos A = \frac{12}{20}$
c) $\tan A = \frac{16}{12}$
d) $\sin B = \frac{12}{20}$
e) $\cos B = \frac{16}{20}$
f) $\tan B = \frac{12}{16}$



3. Use your calculator to evaluate each of the functions below.
(round to four decimal places)

a) $\sin 35^\circ = 0.5736$ b) $\tan 50^\circ = 1.1918$
c) $\tan 40^\circ = 0.8391$ d) $\sin 50^\circ = 0.7660$
e) $\cos 40^\circ = 0.7660$ f) $\cos 35^\circ = 0.8192$

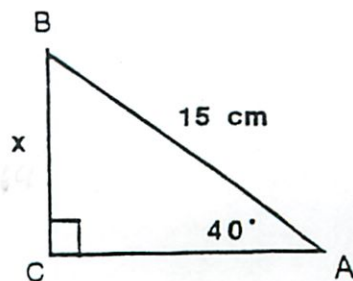
4. Calculate the missing values. Show the trig equation used.

equation used
 $\sin(40) = \frac{x}{15}$

$x = 9.64$

or $\frac{\sin 40}{1} = \frac{x}{15}$

$\sin 40 \times 15 = 1 \times x$
 $0.6427 \times 15 = 9.64$



5. Calculate the missing values. Show the trig equation used.

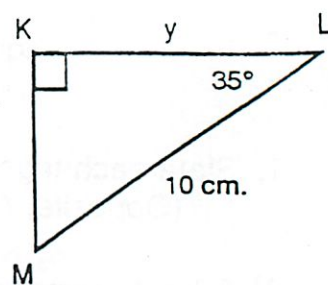
equation used

$$\cos(35) = \frac{y}{10}$$

$$y = 8.19 \text{ cm}$$

$$\frac{8.19}{1} = \frac{y}{10}$$

$$8.19 \times 10 = 8.19 = y$$



6. Calculate the missing values. Show the trig equation used.

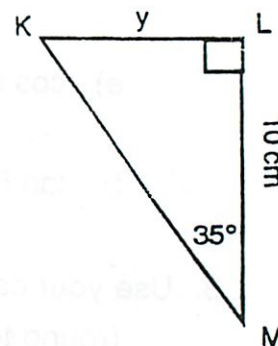
equation used

$$\tan(35) = \frac{\text{opp}}{\text{adj}}$$

$$y = 7.0020 \text{ cm}$$

$$\frac{7.002}{1} = \frac{y}{10}$$

$$7.002 \times 10 = 7.0020$$



Michael Plasencia
Behl
EACH
15 Dec 2005

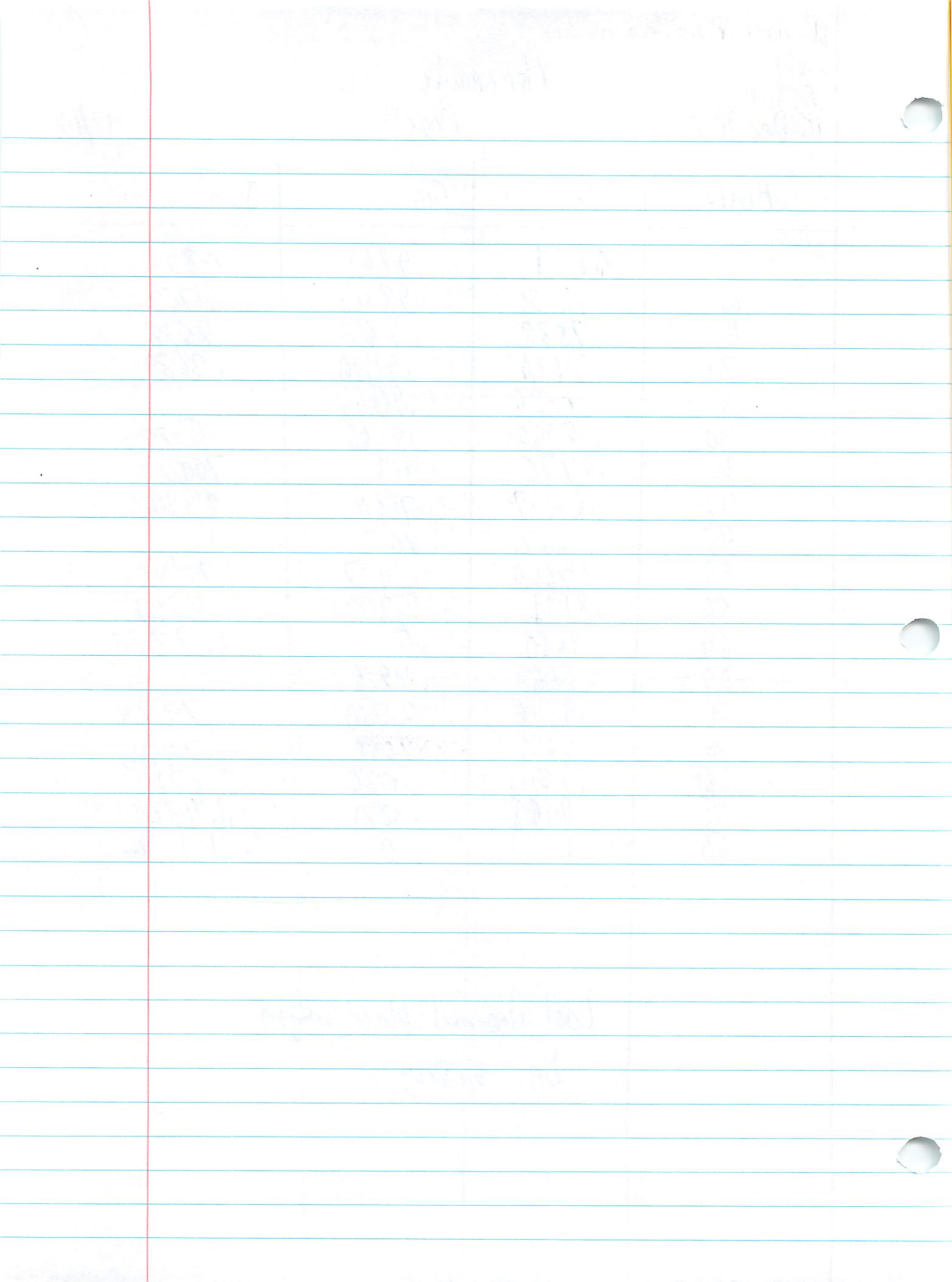
Homemade Trig Chart

(14)

12/15

Angle	Sin	Cos	Tan
- 5	.0871	.9961	.0874
10	.1736	.9848	.1763
15	.2588	.9659	.2679
20	.3420	.9396	.3639
25	.4226	.9063	
30	.5000	.8660	1.5773
35	.5735	.8191	1.7002
40	.6427	.7660	1.8390
45	.7071	.7071	1
50	.7660	.6427	1.1917
55	.8191	.5735	1.4281
60	.8660	.5	1.7320
65	.9063	.4226	
70	.9396	.3420	2.7474
75	.9659	.2588	3.7320
80	.9848	.1736	5.6712
- 85	.9961	.0871	11.4300
90	1	0	Can't bc. Div

Last decimal place might
be wrong



My Contribution to Trig Table

Draw + Measure When Calc

$$\sin(5) = \frac{2.4}{17.8} = .1348 \quad .0812$$

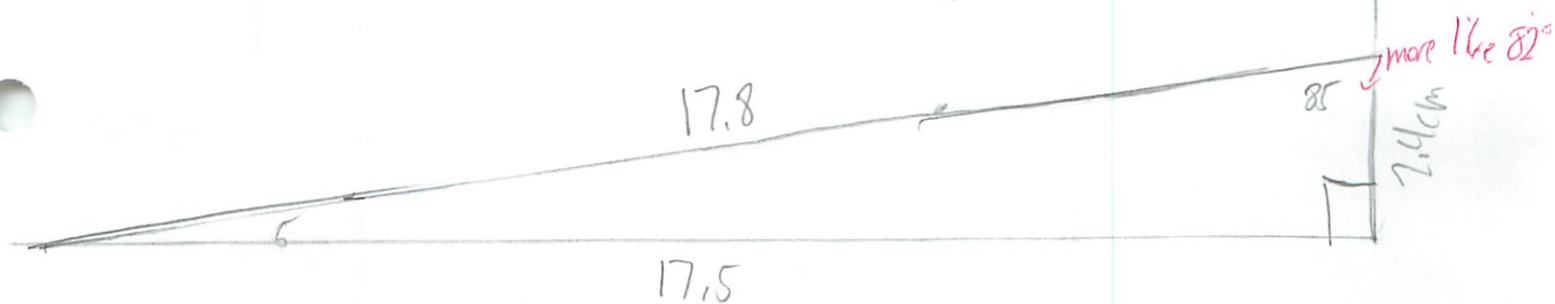
$$\cos(5) = \frac{17.5}{17.8} = .9831 \quad .9962$$

$$\tan(5) = \frac{2.4}{17.5} = .1371 \quad .0875$$

$$\sin(85) = \frac{17.5}{17.8} = .9831 \quad .9962$$

$$\cos(85) = \frac{2.4}{17.8} = .1348 \quad .0812$$

$$\tan(85) = \frac{17.5}{2.4} = 7.291 \quad 11.43$$

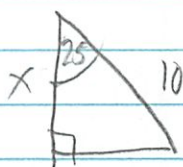


Michael Plaschke
Beitrag
19 Dec 2005

Tig Board Problems

14

1.



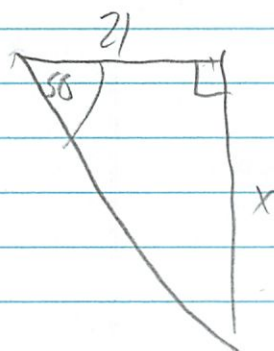
$$\cos(25) = \frac{x}{10}$$

$$\cos(25) \cdot 10 = 1x$$

$$.9063(10) = x$$

$$x = 9.063$$

2.

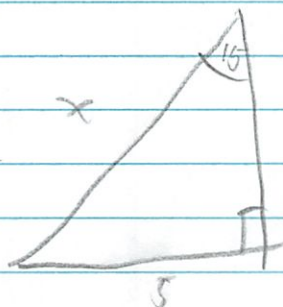


$$\tan(56) = \frac{x}{21}$$

$$1.19(21) = 1x$$

$$25.0268 = x$$

3.



~~Sin = wrong function~~

~~$$\cos(15) = \frac{5}{x}$$~~

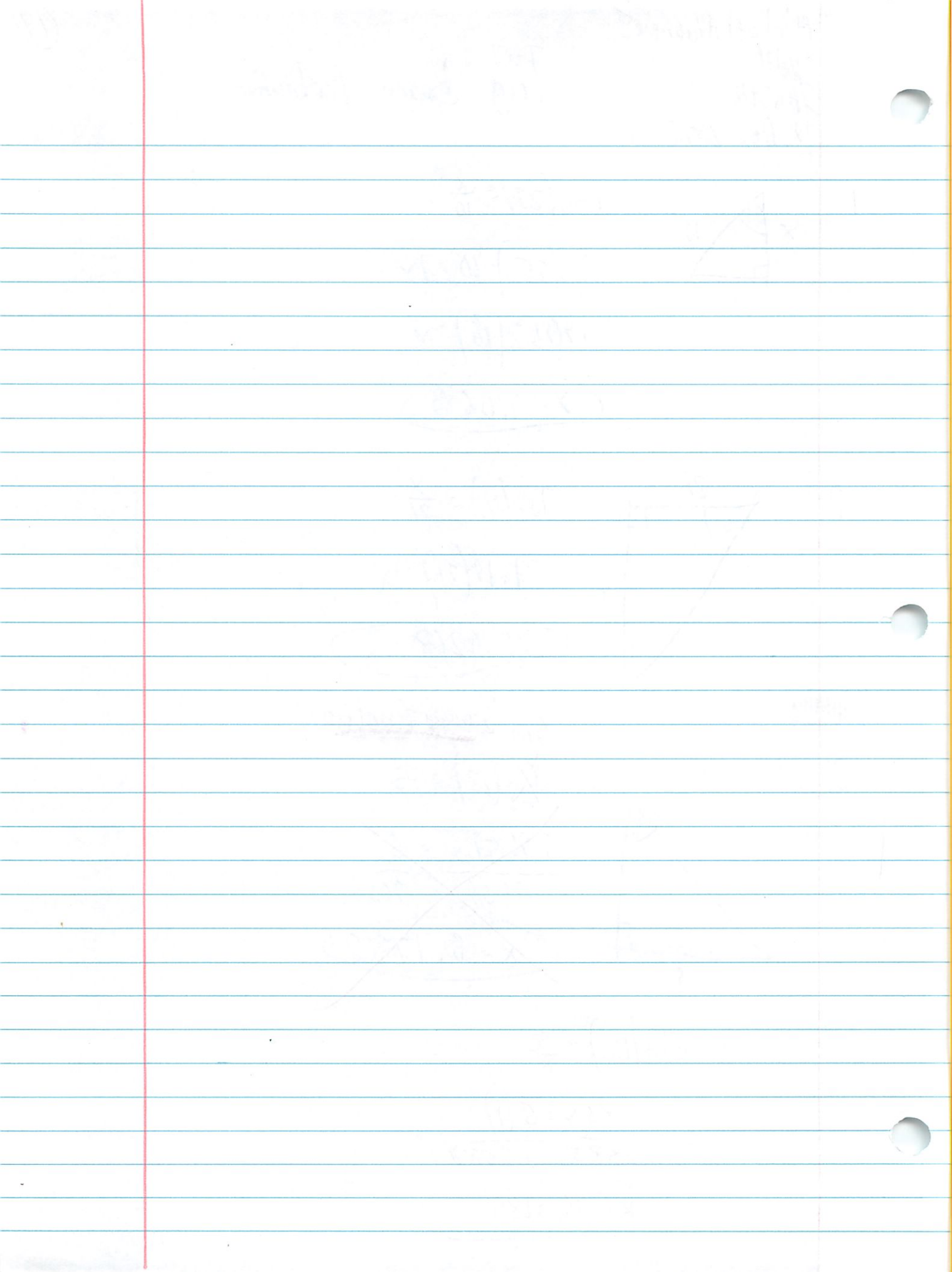
~~$$\frac{.9659x}{.9659} = \frac{5}{.9659}$$~~

~~$$x = 5.17638$$~~

$$\sin(15) = \frac{5}{x}$$

$$\frac{.2588x}{.2588} = \frac{5(1)}{.2588}$$

$$x = 19.3185$$



Michael Placemeier
Behl
TAG 2 H9

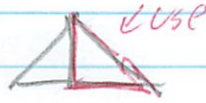
19 Dec 2005

More Gallery Measurements (9)

(15)

12/19

Hint To do - Use part of triangle w/ height as one side to find



1.

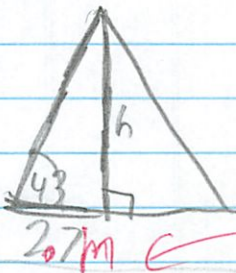


$$\sin(30) = \frac{h}{94}$$

$$.5(94) = h$$

$$(47' = h)$$

2.



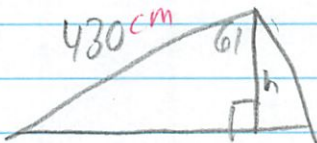
$$\tan(43) = \frac{h}{27}$$

$$.9325(27) = h$$

$$25.1779m = h$$

Copy error w/ decimal point

3



$$\cos(61) = \frac{h}{430cm}$$

$$.4848(430) = h$$

$$208.468cm = h$$

4.



$$\sin(58) = \frac{h}{14ft}$$

$$.848(14) = h$$

$$11.8767ft = h$$

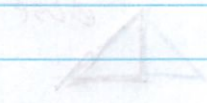
(31)

(a) $\sin(30^\circ) = \frac{h}{10}$

10/10

10/10

Find the height of the building if the angle of elevation is 30° and the distance from the observer to the base of the building is 10 m.



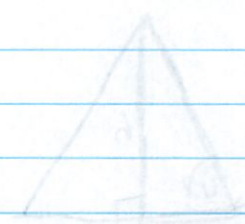
(b) $\sin(45^\circ) = \frac{h}{10}$

$$\sin(45^\circ) = \frac{h}{10}$$
$$h = 10 \sin(45^\circ)$$



(c) $\sin(60^\circ) = \frac{h}{10}$

$$\sin(60^\circ) = \frac{h}{10}$$
$$h = 10 \sin(60^\circ)$$



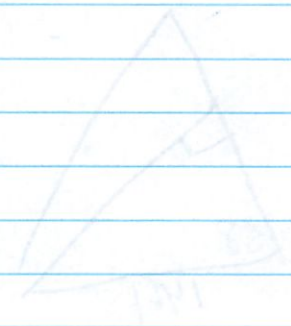
(d) $\sin(75^\circ) = \frac{h}{10}$

$$\sin(75^\circ) = \frac{h}{10}$$
$$h = 10 \sin(75^\circ)$$



$$\sin(80^\circ) = \frac{h}{10}$$
$$h = 10 \sin(80^\circ)$$

(e) $\sin(85^\circ) = \frac{h}{10}$



Michael Plasner
Bohl
IAS 2HR
21 Dec 2005

Shadows + Sails (10)

(16)

12/21

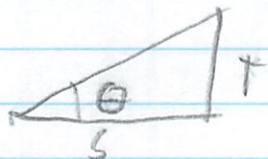
1.

a) $\theta = 35$
 $S = 50$

$$\tan(35) = \frac{x}{50}$$

$$1.7002(50)$$

85.01 ft = tree height



b) $\theta = 60$
 $S = 20$

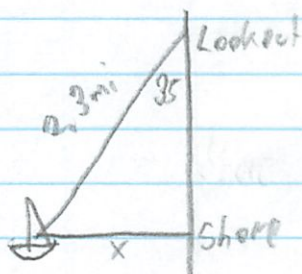
$$\tan(60) = \frac{x}{20}$$

$$1.7320(20)$$

34.64 ft tall tree

c) $\tan(\theta) = \frac{x}{S}$

2.



$$\sin(35) = \frac{x}{2.3 \text{ mi}}$$

$$1.5736(2.3 \text{ mi})$$

$$1.32 \text{ mi}$$

Yes the people can swim to shore

b = θ = angle to boat

L = distance lookout point to boat

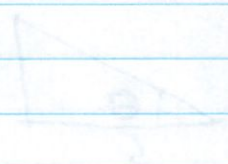
S = distance ship to shore

$$\sin(\theta) = \frac{x}{L} = S$$

③

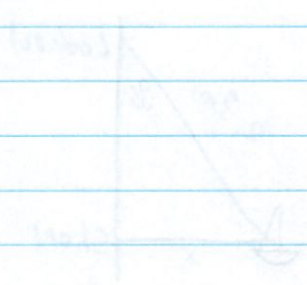
21 Nov 2002
TACOM
Wet

W. 0.37
TACOM
3.2, 0.15



W. 0.37
TACOM
3.2, 0.15

2.4/3.2 = 0.75
1.85 m



In the graph for beam to beam

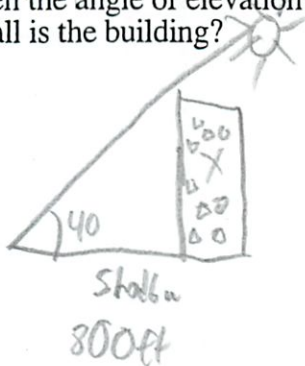
h = 1.85 m
x = distance from beam to beam
y = distance from beam to beam

$$y = \frac{h}{x} = 1.85 / 0.37$$

After Day 21 - Shadows

For each problem, make a right triangular drawing labeled correctly with the given information and a variable for what you are trying to find. FORM A TRIG EQUATION, using sin, cos, or tan; THEN, write an equation that would find your variable. Using a calculator, find the solution to the question.

1. When the angle of elevation of the sun is 40 degrees, a building casts a shadow of 800 feet. How tall is the building?



$$\tan(40) = \frac{x}{800 \text{ ft}}$$

$$.8390(800 \text{ ft})$$

$$671.28 \text{ ft}$$

2. How far up a vertical wall does a 12 foot ladder reach if the angle it makes with the ground is 75 degrees?

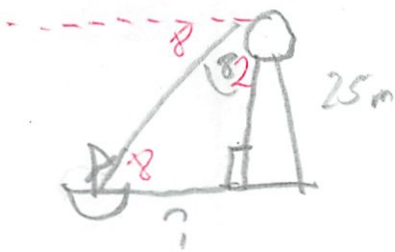


$$\sin(75) = \frac{x}{12 \text{ ft}}$$

$$.966(12 \text{ ft})$$

$$11.59 \text{ ft}$$

3. The operator of a lighthouse spots a sailboat on a line that makes an 8 degree angle with the horizontal. If the top of the lighthouse is 25 meters above sea level, the sailboat is how far away from the base of the lighthouse?



$$\tan(8) = \frac{x}{25 \text{ m}}$$

$$.1405(25 \text{ m})$$

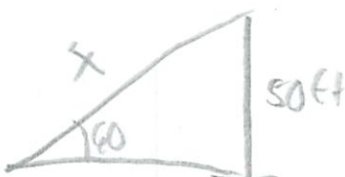
$$3.51 \text{ m}$$

$$7.1154 = \frac{x}{25 \text{ m}}$$

$$7.1154(25) = x$$

$$177.88 \text{ m}$$

4. A support cable for a 50 ft. tower is to make a 60 degree angle with the ground. How long must the cable be? (The cable goes to the top of the tower).



$$\sin(60) = \frac{50 \text{ ft}}{x}$$

$$\frac{.8660x}{.866} = \frac{50 \text{ ft}}{.866}$$

$$x = 57.74 \text{ ft}$$

Name Michael Plasme's
 Period 2B
 Date 1/4

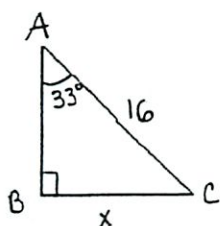
Trig Review

State each trigonometric ration in terms of the sides of a right triangle.

$$\sin A = \frac{\text{Opp}}{\text{Hyp}} \quad \cos A = \frac{\text{Adj}}{\text{Hyp}} \quad \tan A = \frac{\text{Opp}}{\text{Adj}}$$

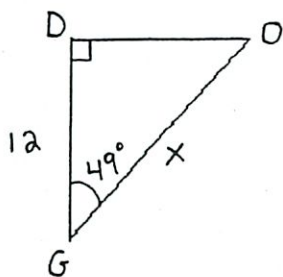
Solve for x. Show all of your work.

1)



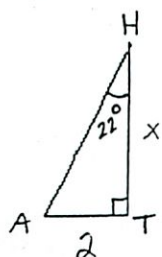
$$\begin{aligned} \sin(33) &= \frac{x}{16} \\ 0.5446(16) &= x \\ 8.71 &= x \end{aligned}$$

2)



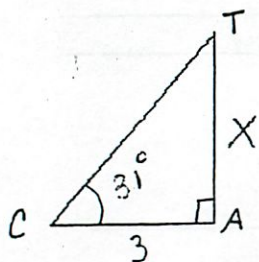
$$\begin{aligned} \cos(49) &= \frac{12}{x} \\ 0.6560x &= 12 \\ 18.291 &= x \end{aligned}$$

3)



$$\begin{aligned} \tan(22) &= \frac{x}{2} \\ 0.4040x &= 2 \\ 4.950 &= x \end{aligned}$$

4)

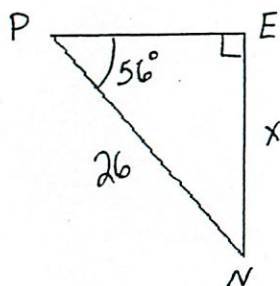


$$\tan(31) = \frac{x}{3}$$

$$1.6009(3) = x$$

$$\boxed{1.8026 = x}$$

5)

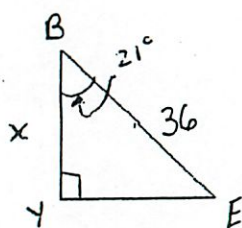


$$\sin(56) = \frac{x}{26}$$

$$1.8298(26) = x$$

$$\boxed{21.55 = x}$$

6)

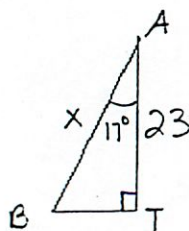


$$\cos(21) = \frac{x}{36}$$

$$1.9336(36) = x$$

$$\boxed{33.609 = x}$$

7)



$$\cos(17) = \frac{23}{x}$$

$$1.9563x = 23$$

$$\frac{23}{1.9563} = x$$

$$\boxed{x = 24.051}$$

Name Michael PlasmierDate 1/4/06**Word Trig Problems**

BE SURE TO SHOW ALL OF YOUR WORK!!!!!!!

1. A wooden beam 6 meters long leans against a wall and makes an angle of 71 degrees with the ground. Find to the how high up the wall the beam reaches.

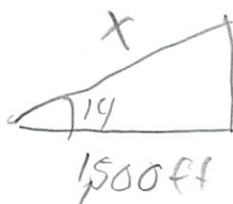


$$\sin(71) = \frac{x}{6m}$$

$$.9455(6m) = x$$

$$5.673m$$

2. An airplane rises at an angle of 14 degrees with the ground. Find the distance the airplane has flown when it has covered a horizontal distance of 1,500 feet.



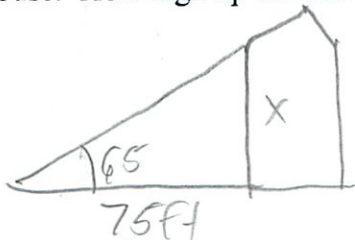
$$\cos(14) = \frac{1500ft}{x}$$

$$.9703x = 1500ft$$

$$\frac{.9703x}{.9703} = \frac{1500}{.9703}$$

$$1546ft$$

3. A tree was damaged in a sever rainstorm. It cracked at its base then leaned over until it touched the neighbor's house wall. The leaning tree made an angle of 65 degrees with the ground. The base of the tree was 75 ft from the neighbor's house. How high up the side of the house did the tree touch?



$$\tan(65) = \frac{x}{75ft}$$

$$2.1445(75ft) = x$$

$$160.84ft$$

44
45

Please do not use
red pen on anything
that you turn in.

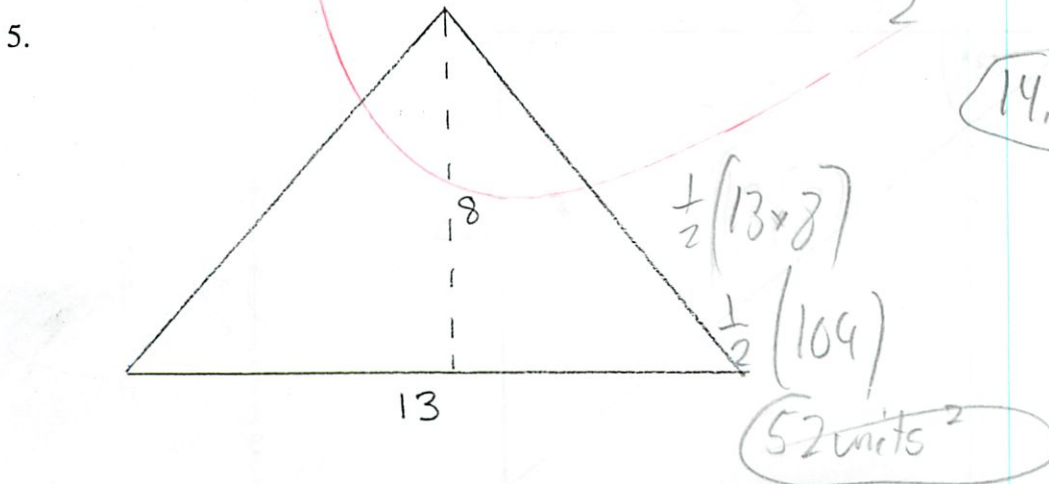
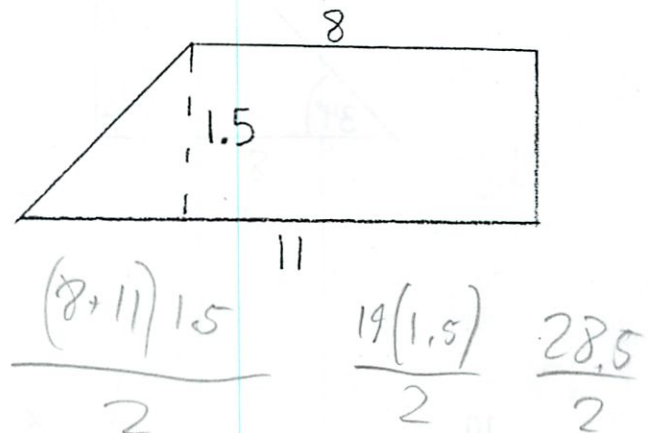
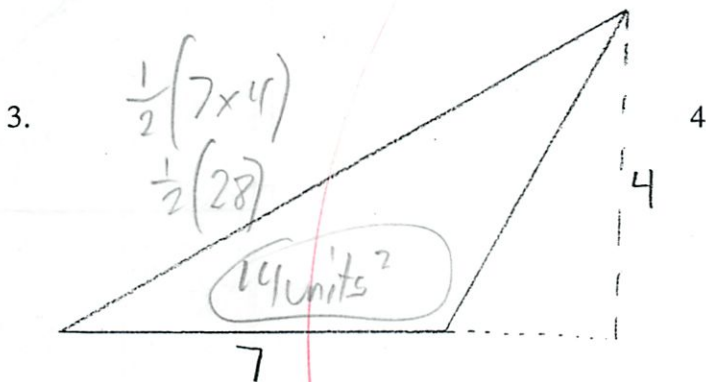
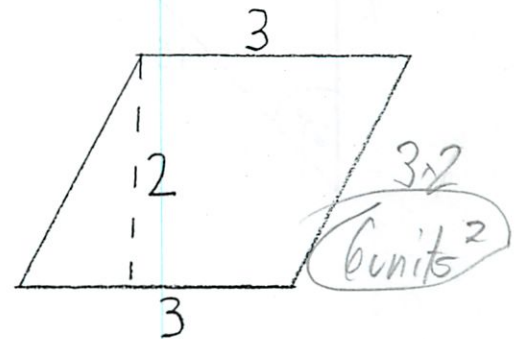
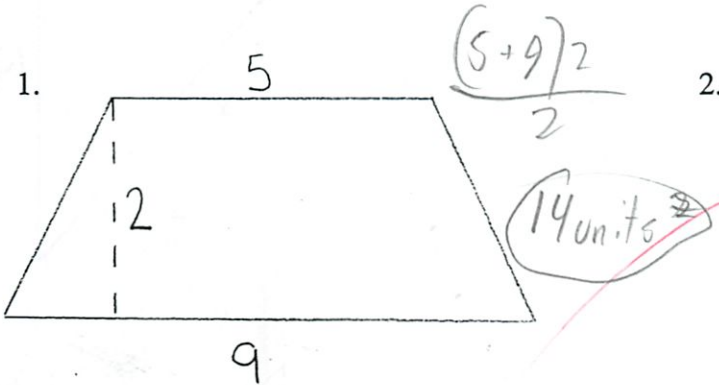
20

I corrected
w/ green
after grade

Name Michael Plasmeier
Period 21
Date 1/4/06

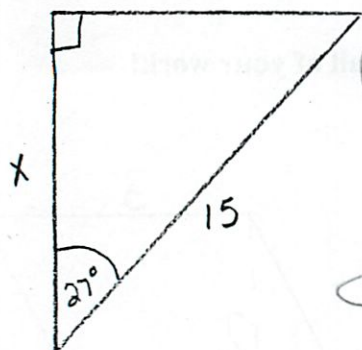
Bee's Review # 1

Directions: Find the areas of these polygons. Be sure to show all of your work!



Directions: Use the information you know about Trig to answer the following questions.
Be sure to show all of your work!

6.

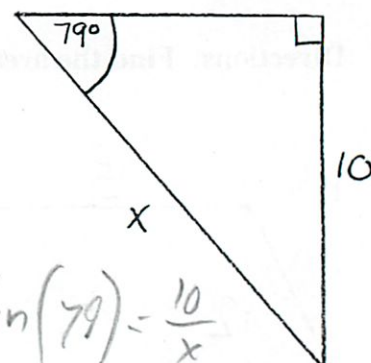


$$\cos(27) = \frac{x}{15}$$

$$.8910(15) = x$$

$$\boxed{13.365 = x}$$

7.



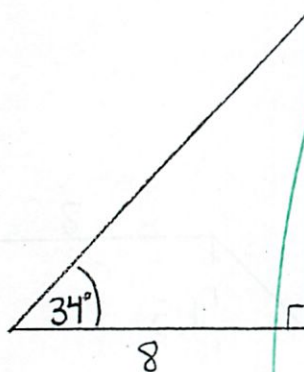
$$\sin(79) = \frac{10}{x}$$

$$.9816x = 10$$

$$\frac{.9816x}{.9816} = \frac{10}{.9816}$$

$$\boxed{x = 10.187}$$

8.

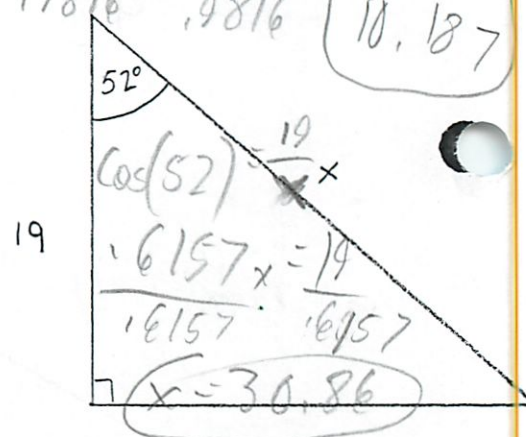


$$\tan(34) = \frac{x}{8}$$

$$.6745(8) = x$$

$$\boxed{5.396 = x}$$

9.



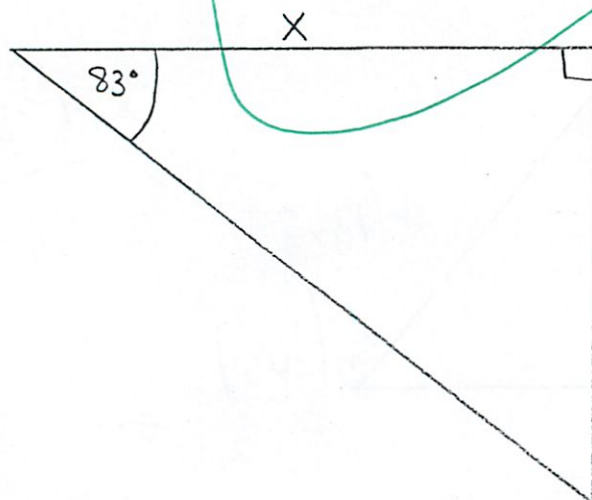
$$\cos(52) = \frac{19}{x}$$

$$.6157x = 19$$

$$\frac{.6157x}{.6157} = \frac{19}{.6157}$$

$$\boxed{x = 30.86}$$

10.



$$\tan(83) = \frac{25}{x}$$

$$8.1443x = 25$$

$$\frac{8.1443x}{8.1443} = \frac{25}{8.1443}$$

$$\boxed{3.0788 = x}$$

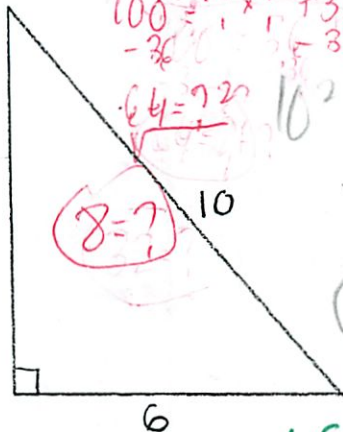
Note: c must always be longest side

$$a^2 + b^2 = c^2$$

$$c = \sqrt{a^2 + b^2}$$

Directions: Use the Pythagorean theorem to answer the following questions. Be sure to show all of your work!

11.



$$10^2 = 8^2 + 6^2$$

$$100 = 64 + 36$$

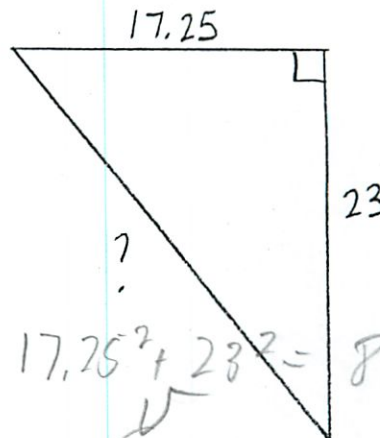
$$100 = 100$$

$$64 = 8^2$$

$$10^2 + 6^2 = 136$$

$$11.662 = ?$$

12.



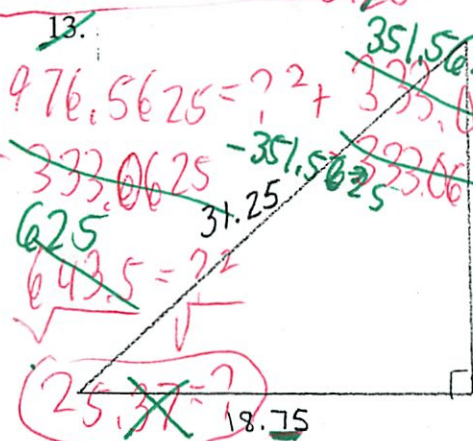
$$17.25^2 + 23^2 = 826.56$$

$$28.75 = ?$$

Copy error

$$31.25^2 = ?^2 + 18.75^2$$

13.



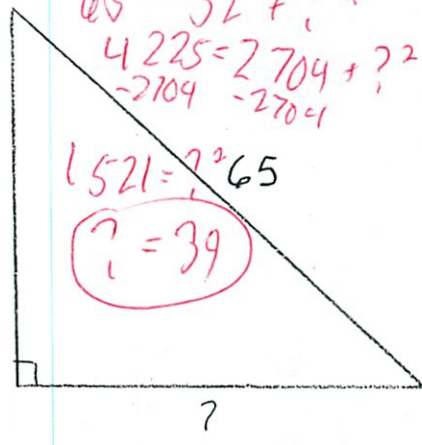
$$31.25^2 + 18.75^2 =$$

$$476.5625 = ?^2 + 351.5625$$

$$1328.125$$

$$36.44 = ?$$

14.



$$65^2 = 52^2 + ?^2$$

$$4225 = 2704 + ?^2$$

$$1521 = ?^2$$

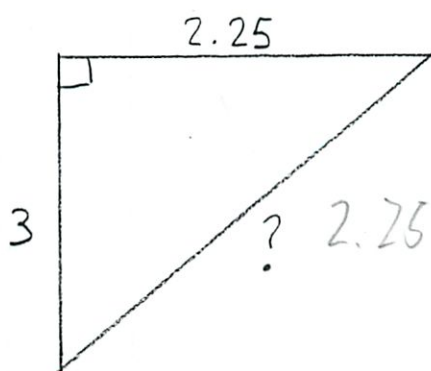
$$39 = ?$$

$$52^2 + 65^2 = 6929$$

$$83.24 = ?$$

The answer is a whole #

15.



$$2.25^2 + 3^2 = 14.0625$$

$$3.75 = ?$$

42
42

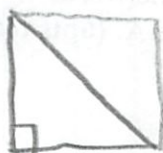
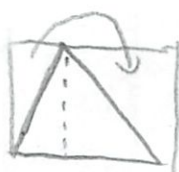
Name Michael Plasmeier
Behl
IAG 2-H
December 21st, 2005

Area and Trig Check-Up Quiz

1. What is the area formula for finding the area of any/all triangles? Explain/Prove why this formula makes sense/works. You may use diagrams in your explanation. (8pts total)

$$\text{area of triangle} = \frac{1}{2}bh$$

Any triangle can be encased in a square.



The triangle will always take up $\frac{1}{2}$ the area of the square. A square's area is base $\times$ height and a triangle is half of that or $\frac{1}{2}$ of base times height.

2. What is the area formula for finding the area of any/all parallelograms? Explain/Prove why this formula makes sense/works. You may use diagrams in your explanation. (8pts total)

$$\text{area of parallelogram} = bh$$

A parallelogram always has its opposite sides congruent. Because of this, you can divide it



into two equal triangles. Because the area of a triangle is $\frac{1}{2}bh$, two of

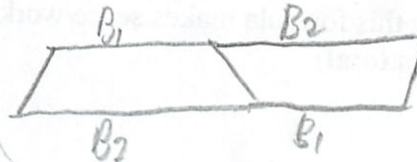
those equal just bh ($\frac{1}{2}bh + \frac{1}{2}bh = bh$). This is

confirmed as a square is also a parallelogram and its area is found using base $\times$ height.

3. What is the area formula for finding the area of any/all trapezoids? Explain/Prove why this formula makes sense/works. You may use diagrams in your explanation. (8pts total)

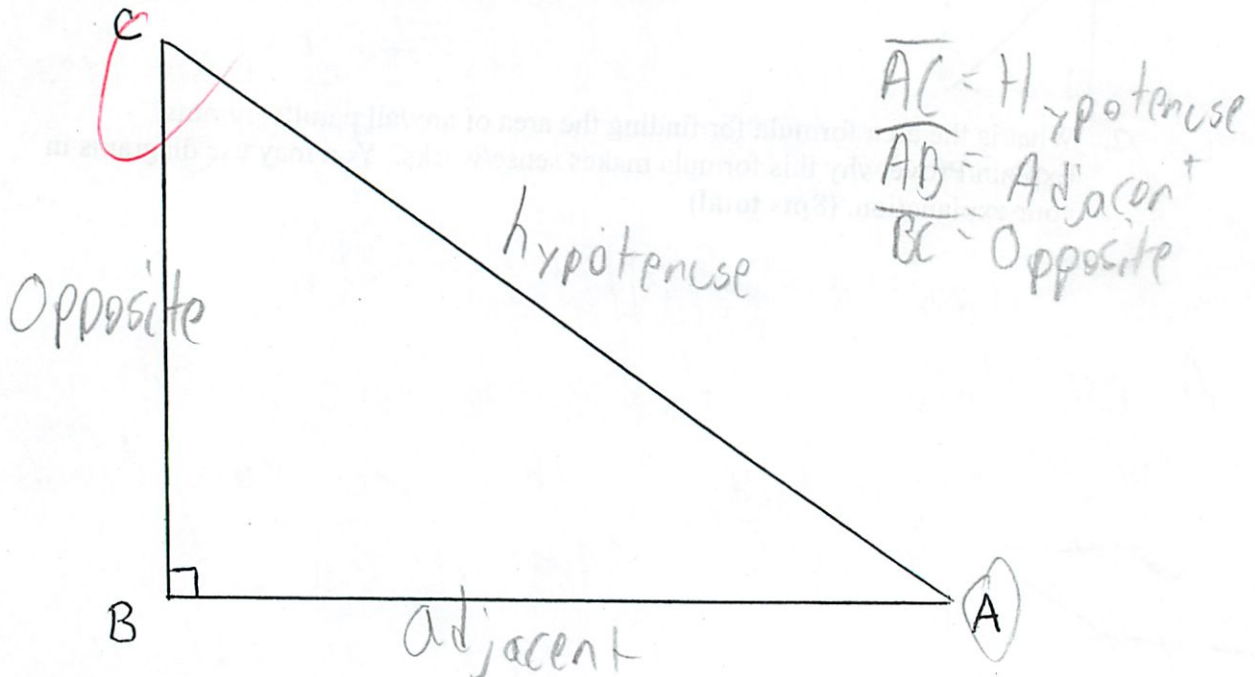
area of a trapezoid = $\frac{(b_1 + b_2)h}{2}$

You are able to join 2 trapezoids together to make a parallelogram.



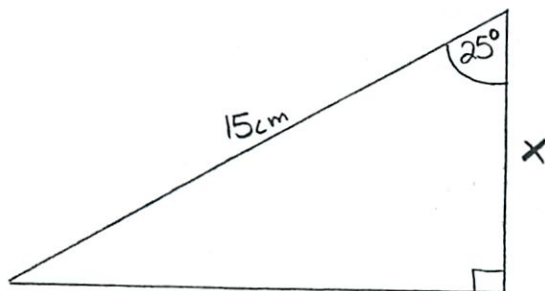
The base is made of Base 1 and Base 2 combined, $(B_1 + B_2)$. You then multiply that with the height like you do with a parallelogram. You must then divide this number in half to find the area of only one trapezoid.

4. On the diagram below, label the sides of the right triangle with the words hypotenuse, opposite, and adjacent. The reference angle is angle A. (6pts total)



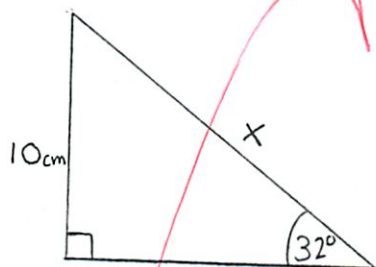
5. For each of the following triangles, set up the proportion that you would use to help you solve each problem. YOU DO NOT HAVE TO ACTUALLY SOLVE THE PROBLEM. (4 pts each)

a.



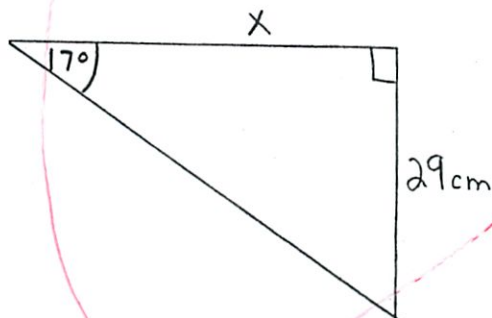
$$\cos(25) = \frac{x}{15 \text{ cm}}$$

b.



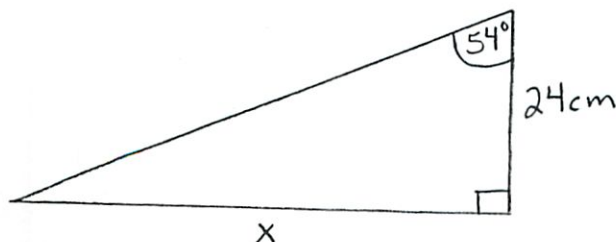
$$\sin(32) = \frac{10 \text{ cm}}{x}$$

c.



$$\tan(17) = \frac{29 \text{ cm}}{x}$$

d.



$$\tan(54) = \frac{x}{24 \text{ cm}}$$

What Do They Call the Big Grass Field on an Orbiting Satellite?

+2

For the first eight exercises, find the length x . For the remaining exercises, find the length needed to solve the problem. Round each answer to the nearest tenth. Cross out each box that contains a correct answer. When you finish, write the letters from the remaining boxes in the spaces at the bottom of the page.

①
 $\sin(32) = \frac{x}{4}$
 $x = 1.5799(4)$
 2.12 m

②
 $\sin(57) = \frac{x}{22}$
 $x = 18.45 \text{ cm}$

③
 $\tan(20) = \frac{x}{30}$
 $x = 10.92 \text{ m}$

④
 $\cos(39) = \frac{x}{8}$
 $x = 6.217 \text{ m}$

⑤
 $\cos(61) = \frac{x}{15}$
 $x = 7.272 \text{ cm}$

⑥
 $\sin(18) = \frac{x}{200}$
 $x = 61.8 \text{ m}$

⑦
 $\tan(43) = \frac{x}{5}$
 $x = 4.66 \text{ m}$

⑧
 $\cos(76) = \frac{x}{70}$
 $x = 16.93 \text{ cm}$

⑨ At a point 20 meters from a flagpole, the angle of elevation of the top of the flagpole is 48° . How tall is the flagpole?

$\tan(48) = \frac{x}{20}$
 $x = 22.21 \text{ m}$

⑩ If a rocket flies 2° off course for 1000 miles, how far from the correct path will the rocket be?

$\sin(2) = \frac{x}{1000}$
 $x = 34.9 \text{ m}$

⑪ As it leans against a building, a 9-meter ladder makes an angle of 55° with the ground. How far is the bottom of the ladder from the base of the building?

$\cos(55) = \frac{x}{9}$
 $x = 5.16 \text{ m}$

TH 4.7 m	AP 5.4 m	ET 5.2 m	E 2.1 m	AR 23.5 m	UN 6.2 m	A 22.2 m	KI 28.7 mi	SS 61.8 m
RU 18.5 cm	NS 3.2 m	TO 7.3 cm	P 63.6 m	UP 34.9 mi	A 15.3 cm	KY 10.9 m	NI 16.9 cm	CE 17.1 cm
A	P	A	R	K	I	N	S	P

A Park in Space

Michael Ploomeier
Behl
DA629H
6 Jan 2005

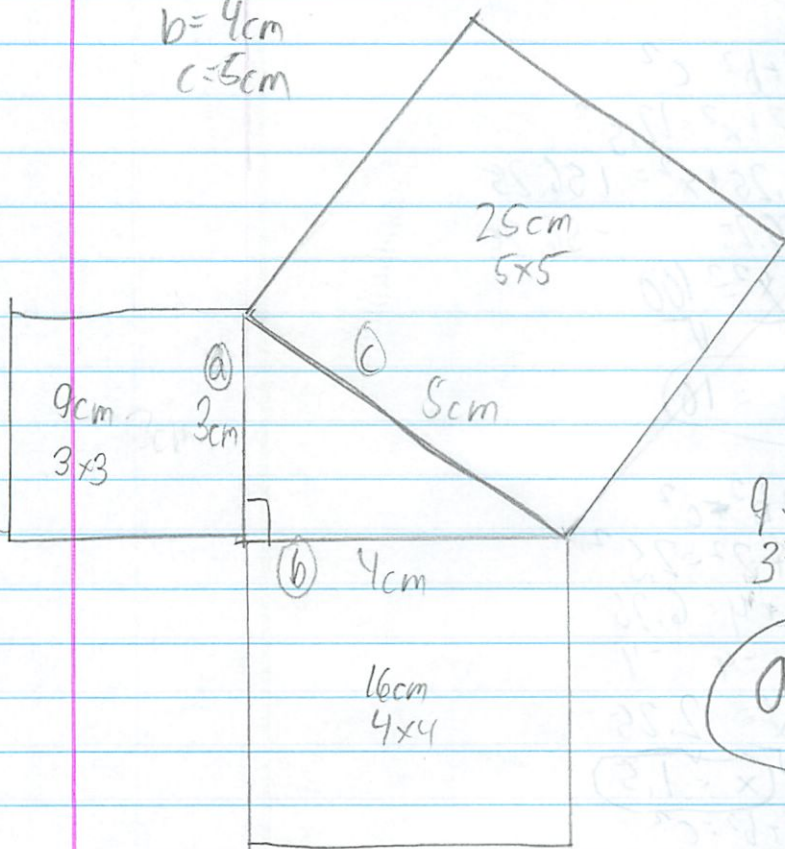
Pythagorean Theorem Notes

(22)

1/6/06

- works only with right triangles

$$\begin{aligned}a &= 3\text{cm} \\b &= 4\text{cm} \\c &= 5\text{cm}\end{aligned}$$



$$\begin{aligned}9 + 16 &= 25 \\3^2 + 4^2 &= 5^2\end{aligned}$$

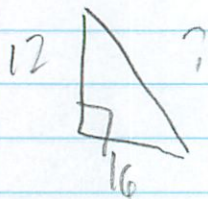
$$a^2 + b^2 = c^2$$

c must always be hypotenuse
a + b must always be legs

Practice →

Board Practice

(1)



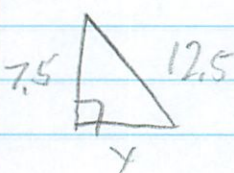
$$a^2 + b^2 = c^2$$

$$12^2 + 16^2 = c^2$$

$$144 + 256 = 400 = c^2$$

$$c = 20$$

(2)



$$a^2 + b^2 = c^2$$

$$7.5^2 + x^2 = 12.5^2$$

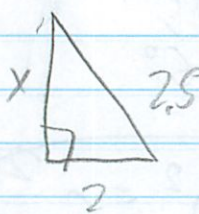
$$56.25 + x^2 = 156.25$$

$$-56.25 \quad -56.25$$

$$x^2 = 100$$

$$x = 10$$

(4)



$$a^2 + b^2 = c^2$$

$$x^2 + 2^2 = 2.5^2$$

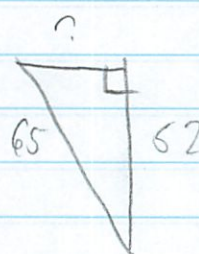
$$x^2 + 4 = 6.25$$

$$-4 \quad -4$$

$$x^2 = 2.25$$

$$x = 1.5$$

(3)



$$a^2 + b^2 = c^2$$

$$x^2 + 62^2 = 65^2$$

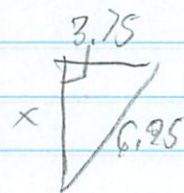
$$x^2 + 3844 = 4225$$

$$-3844 \quad -3844$$

$$x^2 = 381$$

$$x = 19.5$$

(5)



$$a^2 + b^2 = c^2$$

$$x^2 + 3.75^2 = 6.25^2$$

$$x^2 + 14.0625 = 39.0625$$

$$-14.0625 \quad -14.0625$$

$$x^2 = 25$$

$$x = 5$$

Michael Plasmeier
 Behl
 IA62H9
 6 Jan 2006

Any Two Sides
 Work p 228-229

23

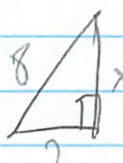
1/6/06

1. a) 4 units ?? (am I thinking this is hard)

b $4 \text{ units}^2 + 4 \text{ units}^2 = 32$

5.66 units long - How can this be -
 yes, a diagonal is longer than a horizontal or vertical line

2.



$$2^2 + x^2 = 8^2$$

$$4 + x^2 = 64$$

$$-4 \quad -4$$

$$x^2 = 60$$

$$x = 7.75$$

3.



$$2.5^2 + 1.5^2 = c^2$$

$$6.25 + 2.25 = 8.5 = c^2$$

$$c = 2.92$$

4. He could use a protractor, but he can see this.

Could do Pythagorean theorem

if measure

(but can't measure)

Divide it up

up into more right triangles

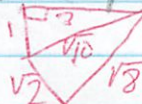
+ theorem

$$1^2 + 1^2 = ?^2$$

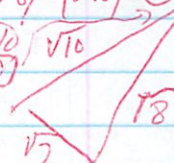
$$? = \sqrt{2}$$



$$2^2 + 2^2 = \sqrt{8}^2$$



$$3^2 + 1^2 = \sqrt{10}$$



must be a right angle

because the line is evenly divided
 and cuts a square in half

$$(\sqrt{2})^2 + (\sqrt{8})^2 = (\sqrt{10})^2$$

$$2 + 8 = 10$$

$$10 = 10$$

hard to explain

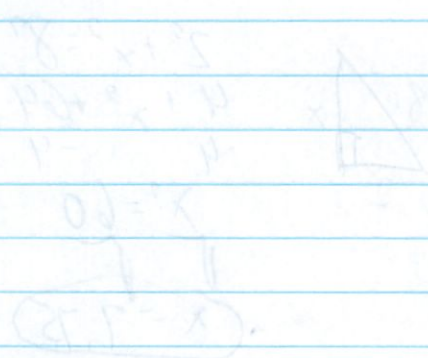
Am Two sides
Work 4320-124

1962
1962

1. 10 ft wide 20 ft long (10 ft wide 20 ft long)

$$10^2 + 20^2 = 30^2$$

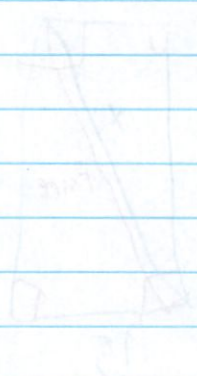
Yes, a diagonal is longer than a horizontal or vertical line.



$$10^2 + 20^2 = 30^2$$

$$100 + 400 = 900$$

$$500 = 900$$



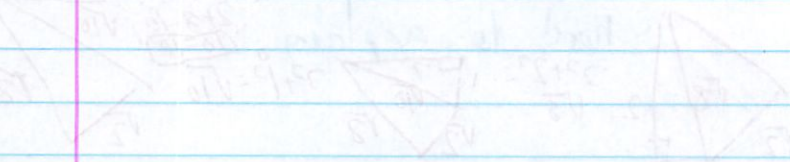
4. The circle is a parallelogram, but it can be a circle.

10 ft wide 20 ft long



because the line is only 10 ft wide and the circle is 20 ft wide.

10 ft wide 20 ft long



Michael Plosner
Behl 1
TAG 2H9
10 Jan 2008

Proof by Rugs

(24)

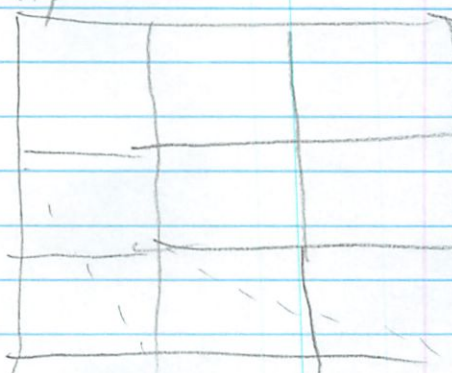
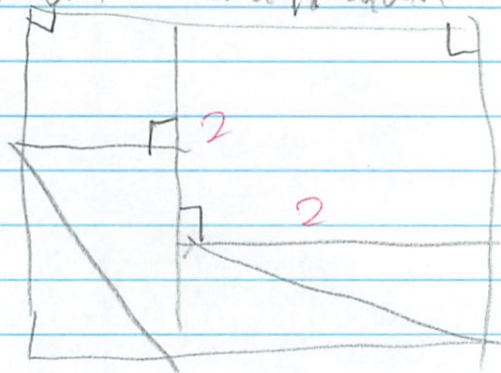
1/10/06

2 small squares = 2 triangles

a small square = a triangle

a medium square = 4 triangles = 1 large square

(length of small square = 1 unit)



small square = 1
4 tri = 4
large square
(2x2) = 4
9

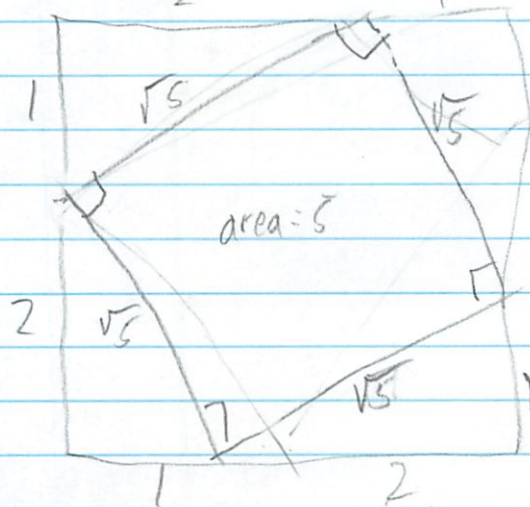
Creates a 3x3 small squares

large square = hyp² = $\sqrt{5}^2$

$$2^2 + 1^2 = \text{hyp}^2$$

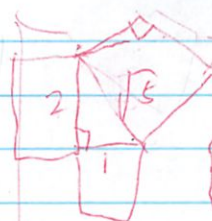
$$4^2 + 1^2 = \sqrt{5}$$

$$\sqrt{5} = 2.24$$



area of large square $(\sqrt{5})^2 = 5$
4 x triangle = $4 \times 1 = \frac{4}{9}$

same as above
 $5 + 4 = 1 + 4 + 4$



$$(1 \times 1) + (2 \times 2) = (\sqrt{5} \times \sqrt{5})$$

$$1^2 + 2^2 = \sqrt{5}^2$$

$$1 + 4 = 5$$

Answer

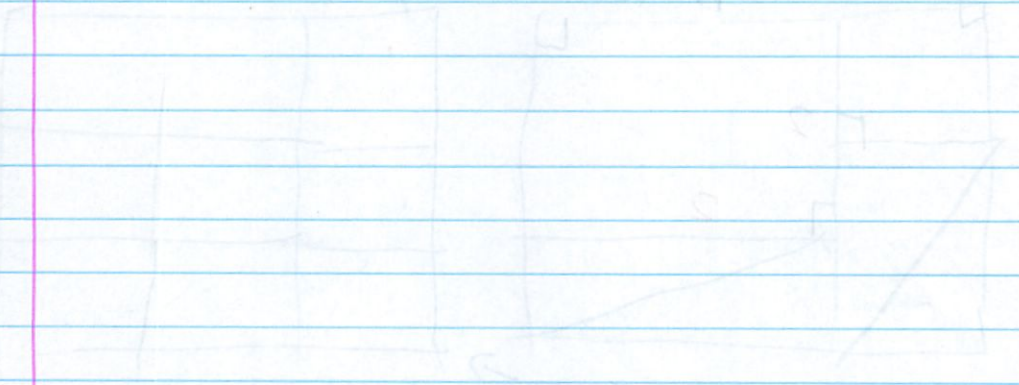
If you take 4 tri's from each
have small sq + medium sq = large sq
 $1^2 + 2^2 = 3^2$

1/10/06

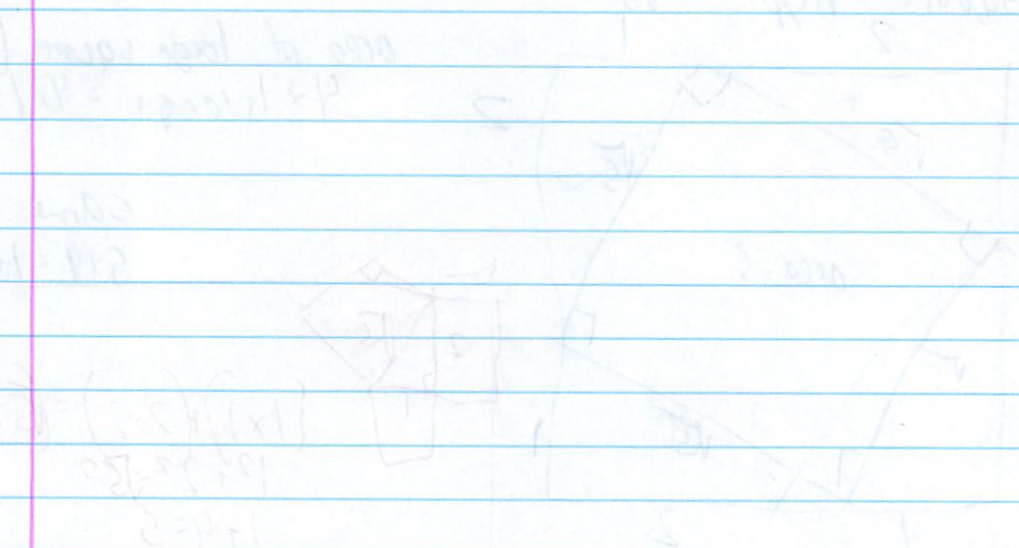
Proof of Pythagoras

11/10/06
10/10/06
10/10/06

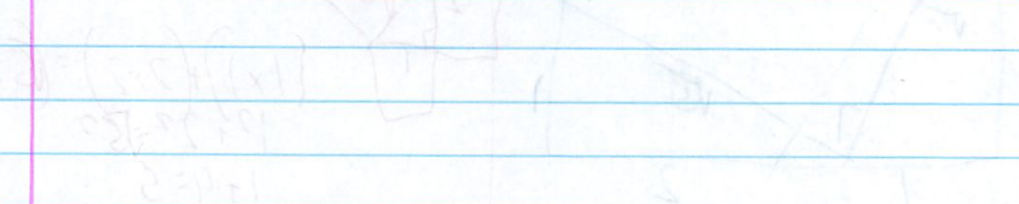
11/10/06
10/10/06
10/10/06
10/10/06
10/10/06



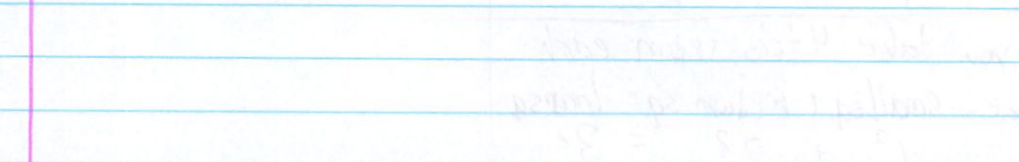
11/10/06
10/10/06
10/10/06
10/10/06
10/10/06



11/10/06
10/10/06
10/10/06
10/10/06
10/10/06



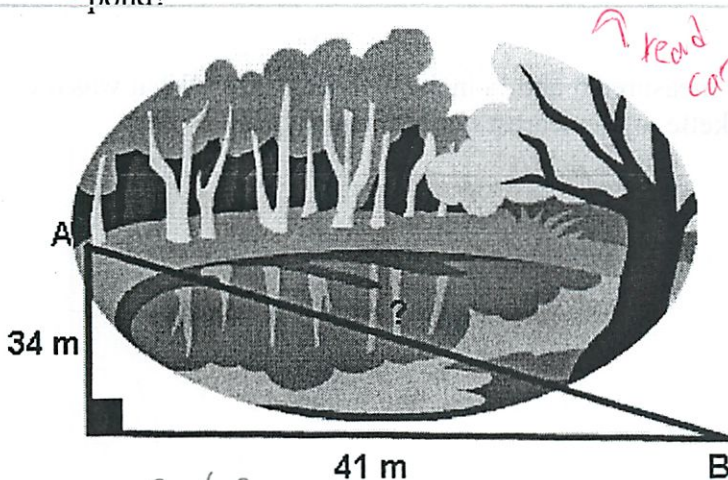
11/10/06
10/10/06
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10/10/06
10/10/06



Name Michael Plummer
Date 1/12

Working with Pythagorean Theorem

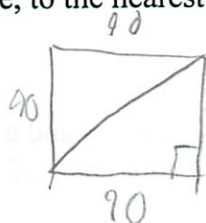
1. To get from point A to point B you must avoid walking through a pond. To avoid the pond, you must walk 34 meters south and 41 meters east. To the nearest meter, how many meters would be saved if it were possible to walk through the pond?



$$\begin{aligned} a^2 + b^2 &= c^2 \\ 34^2 + 41^2 &= c^2 \\ 1156 + 1681 &= 2837 \\ \text{addition problem} \quad \sqrt{2837} &= 53.28 \text{ m} \end{aligned}$$

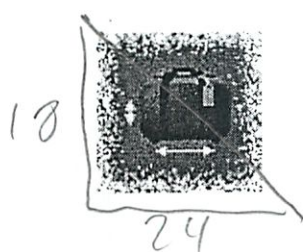
how many to save $(34+41) - 53.28$
 $21.72 \rightarrow$ nearest m -
22m saved

2. A baseball diamond is a square with sides of 90 feet. What is the shortest distance, to the nearest tenth of a foot, between first and third base?



$$\begin{aligned} 90^2 + 90^2 &= c^2 \\ 8100 + 8100 &= 16200 \\ \sqrt{16200} &= 127.3 \text{ ft} \end{aligned}$$

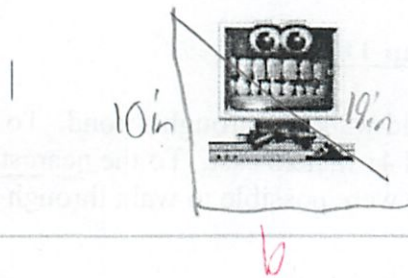
3. A suitcase measures 24 inches long and 18 inches high. What is the diagonal length of the suitcase to the nearest tenth of a foot?



$$\begin{aligned} a^2 + b^2 &= c^2 \\ 18^2 + 24^2 &= c^2 \\ 324 + 576 &= 900 \\ \sqrt{900} &= 30 \text{ in} \end{aligned}$$

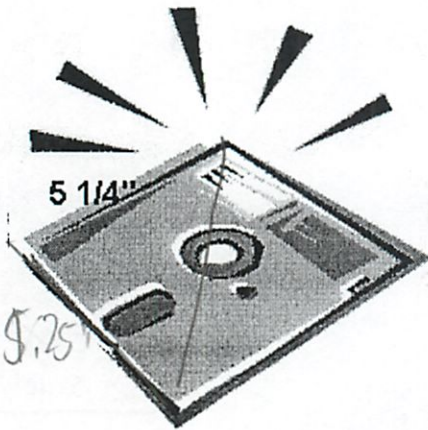
$$30 \text{ in} / 12 \text{ in} = 2.5 \text{ ft}$$

4. In a computer catalog, a computer monitor is listed as being 19 inches. This distance is the diagonal distance across the screen. If the screen measures 10 inches in height, what is the actual width of the screen to the nearest inch?



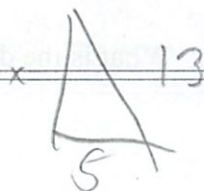
$$\begin{aligned} a^2 + b^2 &= c^2 \\ 10^2 + b^2 &= 19^2 \\ 100 + b^2 &= 361 \\ -100 &\quad -100 \\ b^2 &= 261 \\ \sqrt{} &\quad \sqrt{} \\ b &= 16 \text{ inches} \end{aligned}$$

5. The older floppy diskettes measured 5 and $\frac{1}{4}$ inches on each side. What was the diagonal length of this diskette to the nearest tenth of an inch?



$$\begin{aligned} a^2 + b^2 &= c^2 \\ 5.25^2 + 5.25^2 &= c^2 \\ 27.5625 + 27.5625 &= 55.125 \\ \sqrt{} &\quad \sqrt{} \\ c &= 7.4 \text{ in} \end{aligned}$$

6. Ms. Behl tells you that a right triangle has a hypotenuse of 13 and a leg of 5. She asks you to find the other leg of the triangle. What is your answer?



$$\begin{aligned} a^2 + b^2 &= c^2 \\ 5^2 + b^2 &= 13^2 \\ 25 + b^2 &= 169 \\ -25 &\quad -25 \\ b^2 &= 144 \\ \sqrt{} &\quad \sqrt{} \\ b &= 12 \text{ units} \end{aligned}$$

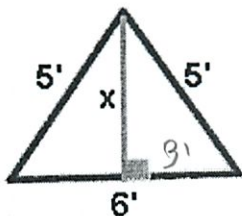
7. Ms. Kaiser, Mr. Smith, and Dr. Brown run 8 miles north and then 5 miles west. What is the shortest distance, to the nearest tenth of a mile, they must travel to return to their starting point?



$$\begin{aligned} a^2 + b^2 &= c^2 \\ 8^2 + 5^2 &= c^2 \\ 64 + 25 &= 89 \end{aligned}$$

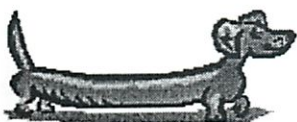
$$\sqrt{89} = 9.4 \text{ mi}$$

8. Oscar's dog house is shaped like a tent. The slanted sides are both 5 feet long and the bottom of the house is 6 feet across. What is the height of his dog house, in feet, at its tallest point?

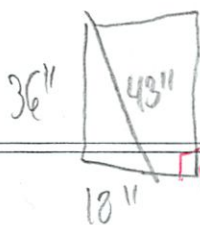


$$\begin{aligned} a^2 + b^2 &= c^2 \\ 3^2 + b^2 &= 5^2 \\ 9 + b^2 &= 25 \\ -9 & \quad -9 \end{aligned}$$

$$\begin{aligned} b^2 &= 16 \\ \sqrt{\quad} & \quad \sqrt{\quad} \\ b &= 4 \text{ feet} \end{aligned}$$



9. Miss Behl made a small rectangular table for her garage. The sides of the table are 36" and 18". If the diagonal of the table measures 43", is the table a square?



No matter what the diagonal is, if the sides are different, it is not a square

Using P. Theorem - $\sqrt{36^2 + 18^2} = 40.25' \neq 43'$

Not a right angle, so can't be square or rectangle

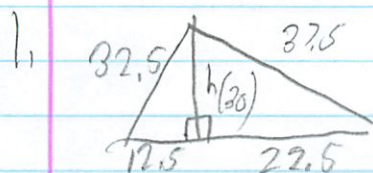
Some of these questions were taken from the following address:
<http://regentsprep.org/Regents/math/fpyth/PracPyth.htm>

Michael Plasmeier
Boh
IAG2 H1
17 Jan 2006

Board Problems

(27)

1/17



Area = ?

Use Pythagorean for one side

$$a^2 + b^2 = c^2$$

$$h^2 + 22.5^2 = 37.5^2$$

$$h^2 + 506.25 = 1406.25$$

$$-506.25 \quad -506.25$$

$$h^2 = 900$$

$$\sqrt{h} = \sqrt{900}$$

✓

$$a = \frac{1}{2}bh$$

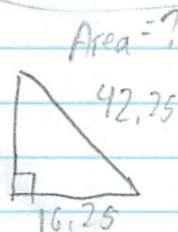
$$a = \frac{1}{2}(12.5 + 22.5)(30)$$

$$a = \frac{1}{2}(35)(30)$$

$$a = 17.5(30)$$

$$a = 525 \text{ units}^2$$

2.



$$a^2 + b^2 = c^2$$

$$h^2 + 16.25^2 = 42.25^2$$

$$h^2 + 264.0625 = 1785.0625$$

$$-264.0625 \quad -264.0625$$

$$h^2 = 1521$$

$$\sqrt{h} = \sqrt{1521}$$

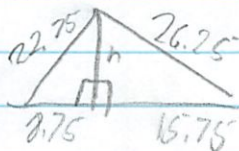
$$a = \frac{1}{2}bh$$

$$a = \frac{1}{2}(16.25)(39)$$

$$a = 19.5(16.25)$$

$$a = 316.875 \text{ units}^2$$

3.



Area = ?

$$a^2 + b^2 = c^2$$

$$h^2 + 15.75^2 = 26.25^2$$

$$h^2 + 248.0625 = 689.0625$$

$$-248.0625 \quad -248.0625$$

$$h^2 = 441$$

$$\sqrt{h} = \sqrt{441}$$

skip a line
otherwise it says

$$\sqrt{441}$$

$$a = \frac{1}{2}bh$$

$$a = \frac{1}{2}(8.75 + 15.75)(21)$$

$$a = \frac{1}{2}(24.5)(21)$$

$$a = 12.25(21)$$

$$a = 257.25 \text{ units}^2$$

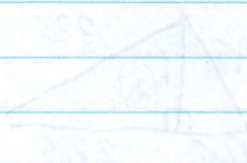
$$h^2 = 441$$

$$\sqrt{h} = \sqrt{441}$$

$$h = 21$$

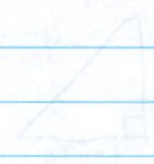
Unit Problems

17 Jan 2008
10:02 AM

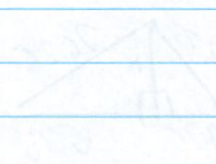


$$a = 300$$
$$b = 400$$
$$c = 500$$

$$a = 300$$
$$b = 400$$
$$c = 500$$



$$a = 300$$
$$b = 400$$
$$c = 500$$



$$a = 300$$
$$b = 400$$
$$c = 500$$

$$a = 300$$
$$b = 400$$
$$c = 500$$

Name Michael Plasmeier
 IAG 2 - H
 BEHL
 1/19/06

44
46

1/19

Bee's Quick Quiz #1

Directions: Complete the following tables by using the information you know about the area of certain polygons. You need to show all of your work for full credit.

1.

AREA OF TRIANGLES

Base	Height	Area
6	3 units	9
2.5 units	10	12.5

$$A_{\text{triangle}} = \frac{1}{2} b h$$

$$9 = \frac{1}{2} (6) h$$

$$\frac{9}{3} = \frac{3h}{3}$$

$$3 \text{ units} = h$$

$$a = \frac{1}{2} b h$$

$$12.5 = \frac{1}{2} b (10)$$

$$\frac{12.5}{5} = \frac{5b}{5}$$

$$2.5 \text{ units} = b$$

2.

AREA OF PARALLELOGRAMS

Base	Height	Area
4	1.5	6 units
7	8 units	56
9 units	3.5	31.5

$$A_{\text{parallelogram}} = b h$$

$$a = 4(1.5)$$

$$a = 6 \text{ units}$$

$$a = b h$$

$$56 = 7h$$

$$\frac{56}{7} = \frac{7h}{7}$$

$$h = 8 \text{ units}$$

3.

$$A_{\text{trapezoid}} = \frac{(B_1 + B_2) h}{2}$$

AREA OF TRAPEZOIDS

Base 1	Base 2	Height	Area
2	5	4	14 units
3	8	4 units	22
6 units	3	4	18

$$a = b h$$

$$31.5 = b(3.5)$$

$$\frac{31.5}{3.5} = \frac{3.5b}{3.5}$$

$$b = 9 \text{ units}$$

$$a = \frac{(B_1 + B_2) h}{2}$$

$$18 = \frac{(6 + 3) 4}{2}$$

$$\times 2 \quad \times 2$$

$$36 = (B_1 + 3) 4$$

$$\frac{36}{4} = \frac{(B_1 + 3) 4}{4}$$

$$9 = B_1 + 3$$

$$-3 \quad -3$$

$$6 \text{ units} = B_1$$

$$a = \frac{(B_1 + B_2) h}{2}$$

$$a = \frac{(2 + 5) 4}{2}$$

$$a = \frac{(7) 4}{2}$$

$$a = \frac{28}{2}$$

$$a = 14 \text{ units}$$

$$a = \frac{(B_1 + B_2) h}{2}$$

$$22 = \frac{(3 + 8) h}{2}$$

$$22 = \frac{11h}{2}$$

$$\times 2 \quad \times 2$$

$$44 = 11h$$

$$\frac{44}{11} = \frac{11h}{11}$$

$$4 \text{ units} = h$$

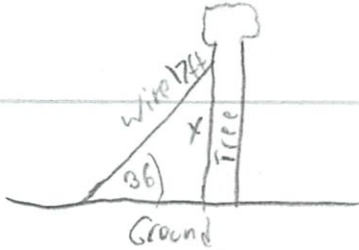
$$\sin = \frac{\text{opp}}{\text{hyp}}$$

$$\cos = \frac{\text{adj}}{\text{hyp}}$$

$$\tan = \frac{\text{opp}}{\text{adj}}$$

Directions: Solve each of the following problems by using trigonometry. You need to show all of your work in order to get full credit.

4. A 17 ft wire is connected to a tree for support. The wire is set at an angle of 36 degrees from the ground. Find the height of the tree. (Round your answer to the nearest tenth of a foot.)



$$\sin(36) = \frac{x}{17\text{ft}}$$

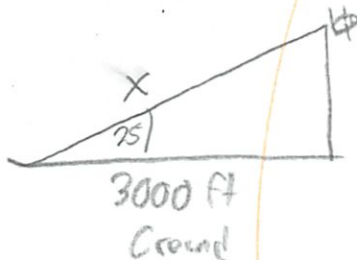
$$.5878(17\text{ft}) = x$$

$$9.99\text{ft} = x$$

round

$$10\text{ft} = \text{height of tree}$$

5. An airplane rises at an angle of 25 degrees with the ground. Find the distance the airplane has flown when it have covered a horizontal distance of 3,000 feet. (Round your answer to the nearest tenth of a foot)



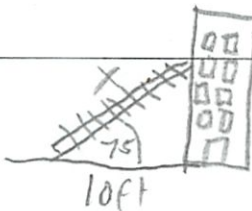
$$\cos(25) = \frac{3000\text{ft}}{x}$$

$$.9063x = 3000\text{ft}$$

$$\frac{.9063x}{.9063} = \frac{3000\text{ft}}{.9063}$$

$$x = 3310.1\text{ft}$$

6. A ladder is leaning up against a building. The bottom of the ladder is 10 feet away from the building, and the ladder makes an angle of 75 degrees with the ground. How long is the ladder? (Round your answer to the nearest tenth of a foot.)



$$\cos(75) = \frac{10\text{ft}}{x}$$

$$.2588x = 10\text{ft}$$

$$\frac{.2588x}{.2588} = \frac{10\text{ft}}{.2588}$$

$$x = 38.6\text{ft ladder}$$

$$a^2 + b^2 = c^2$$

legs hyp

Directions: Use the Pythagorean Theorem to answer the following questions. You need to show all of your work in order to get full credit.

7. The team's teachers have decided that they all need a little more exercise, so they decide to go running together. All of the teachers run 6 miles south and then 4 miles east. What is the shortest distance, to the nearest tenth of a mile, they must travel to return to their starting point? (~~Round your answer to the nearest mile~~)



$$a^2 + b^2 = c^2$$

$$(6 \text{ mi})^2 + (4 \text{ mi})^2 = c^2$$

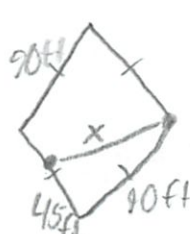
$$36 \text{ mi} + 16 \text{ mi} = c^2$$

$$52 \text{ mi} = c^2$$

$$\sqrt{52 \text{ mi}} = c$$

$$7.2 \text{ mi} = c$$

8. A baseball diamond is a square with sides of 90 feet. If the third baseman fields the ball half way between home plate and 3rd base, how far will he have to throw the ball in order to get the runner out at 1st base? (Round your answer to the nearest tenth of a foot)



$$a^2 + b^2 = c^2$$

$$45 \text{ ft}^2 + 90 \text{ ft}^2 = c^2$$

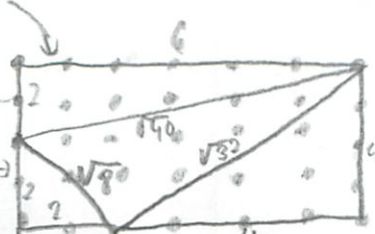
$$2025 \text{ ft} + 8100 \text{ ft} = c^2$$

$$10125 \text{ ft} = c^2$$

$$\sqrt{10125 \text{ ft}} = c$$

$$100.6 \text{ ft} = c$$

9. A student thought that the triangle below looked like a right triangle, but wasn't sure. Find the length of each side of this triangle, and use your answers to determine with certainty whether or not it's a right triangle. Explain your reasoning and be sure to show all of your work.



$$a^2 + b^2 = c^2$$

$$8^2 + 4^2 = c^2$$

$$64 + 16 = c^2$$

$$80 = c^2$$

$$\sqrt{80} = c$$

$$8.94 = c$$

$$a^2 + b^2 = c^2$$

$$2^2 + 2^2 = c^2$$

$$4 + 4 = c^2$$

$$8 = c^2$$

$$\sqrt{8} = c$$

$$2.83 = c$$

$$a^2 + b^2 = c^2$$

$$4^2 + 4^2 = c^2$$

$$16 + 16 = c^2$$

$$32 = c^2$$

$$\sqrt{32} = c$$

$$5.66 = c$$

$$(\sqrt{8})^2 + (\sqrt{32})^2 = (\sqrt{40})^2$$

$$8 + 32 = 40$$

Yes, the object in question is definitely a right triangle. By using the Pythagorean theorem on each side, I found that side's length. Then, on I knew the length of each side I tried $a^2 + b^2 = c^2$. This worked, so I knew this had to be a right triangle.

Michael Plasmeier
Behl
IA62418
27 Jan 2006

Leslie's Flowers (15)

Simple Crazy Triangle

(28)

1/17



Goals:

- Find Height = 12 ft
- Find Area = 84 ft²

Can split up

~~7, 7~~ would be isos. tri,
not scalene

This problem

is a

whole #,

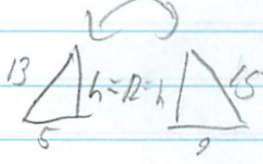
otherwise

can't do this

9, 5
8, 6
10, 4
12, 12
11, 9
13, 1

) Try putting them in

If $h=12$, then you found it

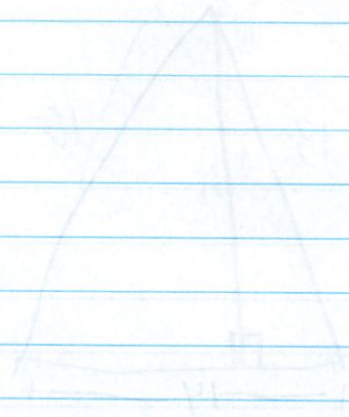


yes, both $h=12$
+ we got in on lot for

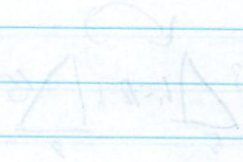
$$A = \frac{1}{2}bh$$

$$A = \frac{1}{2}14(12) = A = 84 \text{ ft}^2$$

Leslie's Theorem (13)



Time Height = 1.5 ft
Time Angle = 30°



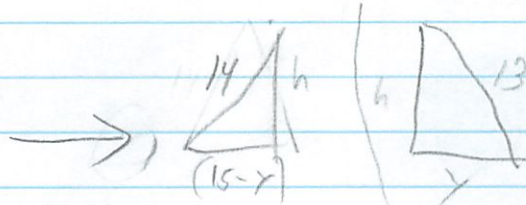
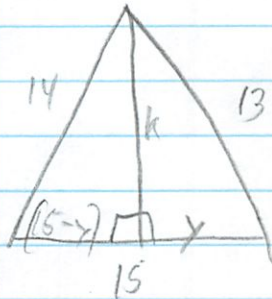
$\frac{1}{2} \times \frac{1}{2} = \frac{1}{4}$

Michael Plasmeter
Behl
IA 62HR
17 Jan 2006

Flowers from Diff Side "Crazy Triangle"

(29)

1/17



y always goes on smaller side

$$\begin{aligned} h^2 + (15-y)^2 &= 14^2 & h^2 + y^2 &= 13^2 \\ h^2 &= 14^2 - (15-y)^2 & h^2 &= 13^2 - y^2 \\ h^2 &= 196 - (15-y)^2 & h^2 &= 169 - y^2 \end{aligned}$$

Combine

Copy Error

$$\begin{aligned} 169 - y^2 &= h^2 = 196 - (15-y)^2 \\ 169 - y^2 &= 196 - (225 + y^2 - 30y) \\ 169 - y^2 &= 196 - 225 - y^2 + 30y \end{aligned}$$

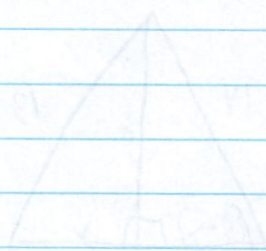
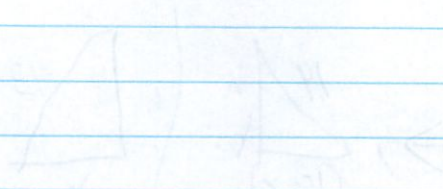
ye always cancel out

$$\begin{aligned} 169 &= 196 - 225 + 30y & \text{plug in} \\ 169 &= -29 + 30y \\ +29 &+29 \\ 198 &= 30y \\ \frac{198}{30} &= \frac{30y}{30} \\ 6.6 &= y \end{aligned}$$

$$\begin{aligned} (15-y)(15-y) \\ 225 + y^2 - 15y - 15y \\ 225 + y^2 + 30y \end{aligned}$$

$$\begin{aligned} h^2 &= 169 - y^2 \\ h^2 &= 169 - 6.6^2 \\ h^2 &= 169 - 43.56 \\ h^2 &= 125.44 \\ \sqrt{} &\sqrt{} \\ h &= 11.2 \text{ ft} \end{aligned}$$

$$\begin{aligned} a &= \frac{1}{2}bh \\ a &= \frac{1}{2}(15)11.2 \\ a &= 7.5(11.2) \\ a &= 84 \text{ ft}^2 \end{aligned}$$



$\frac{d}{dt} \left(\frac{1}{2} m v^2 + U(r) \right) = 0$

0.11 0.12 0.13 0.14 0.15 0.16 0.17 0.18 0.19 0.20 0.21 0.22 0.23 0.24 0.25 0.26 0.27 0.28 0.29 0.30 0.31 0.32 0.33 0.34 0.35 0.36 0.37 0.38 0.39 0.40 0.41 0.42 0.43 0.44 0.45 0.46 0.47 0.48 0.49 0.50 0.51 0.52 0.53 0.54 0.55 0.56 0.57 0.58 0.59 0.60 0.61 0.62 0.63 0.64 0.65 0.66 0.67 0.68 0.69 0.70 0.71 0.72 0.73 0.74 0.75 0.76 0.77 0.78 0.79 0.80 0.81 0.82 0.83 0.84 0.85 0.86 0.87 0.88 0.89 0.90 0.91 0.92 0.93 0.94 0.95 0.96 0.97 0.98 0.99 1.00 1.01 1.02 1.03 1.04 1.05 1.06 1.07 1.08 1.09 1.10 1.11 1.12 1.13 1.14 1.15 1.16 1.17 1.18 1.19 1.20 1.21 1.22 1.23 1.24 1.25 1.26 1.27 1.28 1.29 1.30 1.31 1.32 1.33 1.34 1.35 1.36 1.37 1.38 1.39 1.40 1.41 1.42 1.43 1.44 1.45 1.46 1.47 1.48 1.49 1.50 1.51 1.52 1.53 1.54 1.55 1.56 1.57 1.58 1.59 1.60 1.61 1.62 1.63 1.64 1.65 1.66 1.67 1.68 1.69 1.70 1.71 1.72 1.73 1.74 1.75 1.76 1.77 1.78 1.79 1.80 1.81 1.82 1.83 1.84 1.85 1.86 1.87 1.88 1.89 1.90 1.91 1.92 1.93 1.94 1.95 1.96 1.97 1.98 1.99 2.00 2.01 2.02 2.03 2.04 2.05 2.06 2.07 2.08 2.09 2.10 2.11 2.12 2.13 2.14 2.15 2.16 2.17 2.18 2.19 2.20 2.21 2.22 2.23 2.24 2.25 2.26 2.27 2.28 2.29 2.30 2.31 2.32 2.33 2.34 2.35 2.36 2.37 2.38 2.39 2.40 2.41 2.42 2.43 2.44 2.45 2.46 2.47 2.48 2.49 2.50 2.51 2.52 2.53 2.54 2.55 2.56 2.57 2.58 2.59 2.60 2.61 2.62 2.63 2.64 2.65 2.66 2.67 2.68 2.69 2.70 2.71 2.72 2.73 2.74 2.75 2.76 2.77 2.78 2.79 2.80 2.81 2.82 2.83 2.84 2.85 2.86 2.87 2.88 2.89 2.90 2.91 2.92 2.93 2.94 2.95 2.96 2.97 2.98 2.99 3.00 3.01 3.02 3.03 3.04 3.05 3.06 3.07 3.08 3.09 3.10 3.11 3.12 3.13 3.14 3.15 3.16 3.17 3.18 3.19 3.20 3.21 3.22 3.23 3.24 3.25 3.26 3.27 3.28 3.29 3.30 3.31 3.32 3.33 3.34 3.35 3.36 3.37 3.38 3.39 3.40 3.41 3.42 3.43 3.44 3.45 3.46 3.47 3.48 3.49 3.50 3.51 3.52 3.53 3.54 3.55 3.56 3.57 3.58 3.59 3.60 3.61 3.62 3.63 3.64 3.65 3.66 3.67 3.68 3.69 3.70 3.71 3.72 3.73 3.74 3.75 3.76 3.77 3.78 3.79 3.80 3.81 3.82 3.83 3.84 3.85 3.86 3.87 3.88 3.89 3.90 3.91 3.92 3.93 3.94 3.95 3.96 3.97 3.98 3.99 4.00 4.01 4.02 4.03 4.04 4.05 4.06 4.07 4.08 4.09 4.10 4.11 4.12 4.13 4.14 4.15 4.16 4.17 4.18 4.19 4.20 4.21 4.22 4.23 4.24 4.25 4.26 4.27 4.28 4.29 4.30 4.31 4.32 4.33 4.34 4.35 4.36 4.37 4.38 4.39 4.40 4.41 4.42 4.43 4.44 4.45 4.46 4.47 4.48 4.49 4.50 4.51 4.52 4.53 4.54 4.55 4.56 4.57 4.58 4.59 4.60 4.61 4.62 4.63 4.64 4.65 4.66 4.67 4.68 4.69 4.70 4.71 4.72 4.73 4.74 4.75 4.76 4.77 4.78 4.79 4.80 4.81 4.82 4.83 4.84 4.85 4.86 4.87 4.88 4.89 4.90 4.91 4.92 4.93 4.94 4.95 4.96 4.97 4.98 4.99 5.00 5.01 5.02 5.03 5.04 5.05 5.06 5.07 5.08 5.09 5.10 5.11 5.12 5.13 5.14 5.15 5.16 5.17 5.18 5.19 5.20 5.21 5.22 5.23 5.24 5.25 5.26 5.27 5.28 5.29 5.30 5.31 5.32 5.33 5.34 5.35 5.36 5.37 5.38 5.39 5.40 5.41 5.42 5.43 5.44 5.45 5.46 5.47 5.48 5.49 5.50 5.51 5.52 5.53 5.54 5.55 5.56 5.57 5.58 5.59 5.60 5.61 5.62 5.63 5.64 5.65 5.66 5.67 5.68 5.69 5.70 5.71 5.72 5.73 5.74 5.75 5.76 5.77 5.78 5.79 5.80 5.81 5.82 5.83 5.84 5.85 5.86 5.87 5.88 5.89 5.90 5.91 5.92 5.93 5.94 5.95 5.96 5.97 5.98 5.99 6.00 6.01 6.02 6.03 6.04 6.05 6.06 6.07 6.08 6.09 6.10 6.11 6.12 6.13 6.14 6.15 6.16 6.17 6.18 6.19 6.20 6.21 6.22 6.23 6.24 6.25 6.26 6.27 6.28 6.29 6.30 6.31 6.32 6.33 6.34 6.35 6.36 6.37 6.38 6.39 6.40 6.41 6.42 6.43 6.44 6.45 6.46 6.47 6.48 6.49 6.50 6.51 6.52 6.53 6.54 6.55 6.56 6.57 6.58 6.59 6.60 6.61 6.62 6.63 6.64 6.65 6.66 6.67 6.68 6.69 6.70 6.71 6.72 6.73 6.74 6.75 6.76 6.77 6.78 6.79 6.80 6.81 6.82 6.83 6.84 6.85 6.86 6.87 6.88 6.89 6.90 6.91 6.92 6.93 6.94 6.95 6.96 6.97 6.98 6.99 7.00 7.01 7.02 7.03 7.04 7.05 7.06 7.07 7.08 7.09 7.10 7.11 7.12 7.13 7.14 7.15 7.16 7.17 7.18 7.19 7.20 7.21 7.22 7.23 7.24 7.25 7.26 7.27 7.28 7.29 7.30 7.31 7.32 7.33 7.34 7.35 7.36 7.37 7.38 7.39 7.40 7.41 7.42 7.43 7.44 7.45 7.46 7.47 7.48 7.49 7.50 7.51 7.52 7.53 7.54 7.55 7.56 7.57 7.58 7.59 7.60 7.61 7.62 7.63 7.64 7.65 7.66 7.67 7.68 7.69 7.70 7.71 7.72 7.73 7.74 7.75 7.76 7.77 7.78 7.79 7.80 7.81 7.82 7.83 7.84 7.85 7.86 7.87 7.88 7.89 7.90 7.91 7.92 7.93 7.94 7.95 7.96 7.97 7.98 7.99 8.00 8.01 8.02 8.03 8.04 8.05 8.06 8.07 8.08 8.09 8.10 8.11 8.12 8.13 8.14 8.15 8.16 8.17 8.18 8.19 8.20 8.21 8.22 8.23 8.24 8.25 8.26 8.27 8.28 8.29

19 Jan 2006

Crazy Triangle Problem

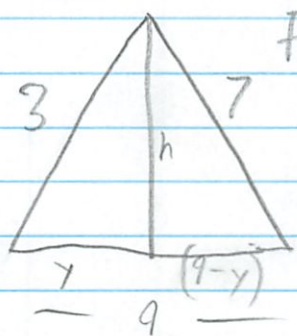
On your own

(30)

1/19

Steps

1. Draw Diagram + label side
2. Divide base into 2 parts, - Smaller part = x - Larger part = $(\text{base} - x)$
3. Divide Big triangle into 2 smaller triangle + label sides
4. Use Phy. theorem to get an equation for h^2 (Both triangles)
5. Using the 2 equations from Step 4, ($h^2 =$) set the equations = to each other + simplify
6. Solve that equation for x (Remember to distribute the negative, x^2 should cancel out)
7. Once you solve for x , plug in that value into one of the h^2 equations to solve for h
8. Using h , find area.



Find the area



$$3^2 = x^2 + h^2$$

$$9 = x^2 + h^2$$

$$h^2 = 9 - x^2$$



$$7^2 = h^2 + (9-x)^2$$

$$49 = h^2 + (9-x)^2$$

$$h^2 = 49 - (9-x)^2$$

$$9 - x^2 = 49 - (9-x)^2 \quad \leftarrow (9-x)(9-x)$$

$$9 - x^2 = 49 - (81 - 18x + x^2)$$

$$9 - x^2 = 49 - 81 + 18x - x^2$$

$$9 = -32 + 18x$$

$$41 = 18x$$

$$x = 2.277$$

$$3^2 = 2.27^2 + h^2$$

$$9 = 5.188 + h^2$$

$$h^2 = 3.811$$

$$h = 1.95$$

$$\frac{1}{2}bh$$

$$\frac{1}{2}(9)(1.95)$$

$$a = 8.79$$

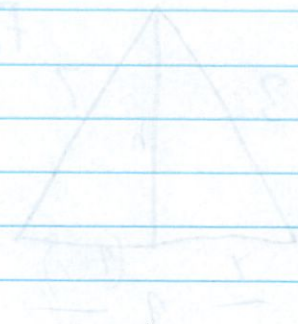
Units²

Or you can
(cos + triangle problem)

14.92.300
14.92.300

Steps

1. Draw triangle, label sides
2. Divide into 2 parts - smaller part = x - larger part = y
3. Divide the triangle into 2 smaller triangles + 1 rectangle
4. Use the theorem to get an equation for x (or y)
5. Use the theorem to get an equation for y (or x)
6. Solve the equations for x (remember to check the answer)
7. Use the value of x to find the value of y
8. Use the value of y to find the value of x



$$h = 14.92$$

$$x = 14.92$$

$$y = 14.92$$

$$h = 14.92$$

$$x = 14.92$$

$$y = 14.92$$

$$h = 14.92$$

$$x = 14.92$$

$$y = 14.92$$

$$h = 14.92$$

$$x = 14.92$$

$$y = 14.92$$

$$h = 14.92$$

$$x = 14.92$$

$$y = 14.92$$

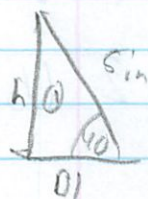
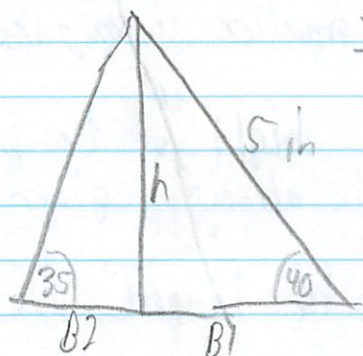
Michael Plasmeier
Bohl
IAG2H9
23 Jan 2009

Crazy Triangle w/ Angles

(81)

1/23

Find the Area



$$\sin(40) = \frac{h}{5 \text{ in}}$$

$$.6428 = \frac{h}{5 \text{ in}}$$

$$.6428(5 \text{ in}) = h$$

$$3.21 = h$$

$$\cos(40) = \frac{B1}{5 \text{ in}}$$

$$.7660(5 \text{ in}) = B1$$

$$3.83 = B1$$

$$\tan(35) = \frac{3.21}{B2}$$

$$.7002 B2 = 3.21$$

$$\frac{.7002}{.7002} \quad \frac{3.21}{.7002}$$

$$B2 = 4.5844$$

$$B1 + B2 = B$$

$$3.83 + 4.5844 = B$$

$$8.4144 = B$$

$$a = \frac{1}{2}bh$$

$$a = \frac{1}{2}(8.4144)(3.21)$$

$$a = 13.5050 \text{ in}^2$$

Steps on back

Crazy Triangle w/ Angles Steps

1. Divide the big triangle into 2 smaller triangles & label
2. Using Trig to solve for either height or the base of the triangle, where 1 side is already given
3. Using the given side, solve for the length you didn't do in Step 2
4. Use Trig to solve for the base of the 2nd Triangle
5. Use the area formula ($\frac{1}{2}bh$) to find the area

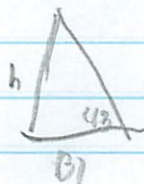
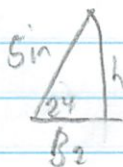
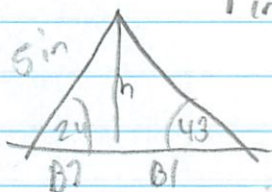
Michael Plasmeier
Behl
SAG 2H

23 Jan 2006

Our Group

1/23/06

Find Area



$$\begin{aligned} \textcircled{1} \quad \sin(24) &= \frac{h}{B_2} \\ .4067(\sin)h & \\ \boxed{2.033 = h} \end{aligned}$$

$$\begin{aligned} \textcircled{2} \quad \tan(43) &= \frac{h}{B_1} \\ .9325(2.033) &= \frac{2.033}{B_1} \\ .9325 & \\ B_1 &= 2.1809 \end{aligned}$$

$$\begin{aligned} \textcircled{3} \quad \cos(24) &= \frac{B_2}{B_1} \\ .9135(\sin) & \\ \boxed{4.5677 = B_2} \end{aligned}$$

$$\begin{aligned} \textcircled{4} \quad B_1 + B_2 &= B \\ 2.1809 + 4.5677 &= 6.7486 \end{aligned}$$

$$\begin{aligned} \textcircled{5} \quad a &= \frac{1}{2}bh \\ a &= \frac{1}{2}(6.7486)(2.033) \end{aligned}$$

$$a = 6.862242863 \text{ in}^2$$

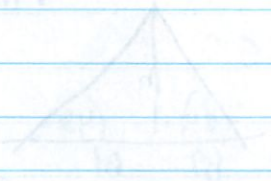
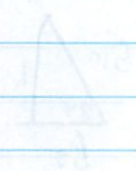
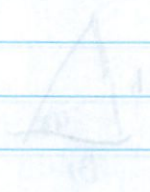
$$\text{or } \boxed{6.86 \text{ in}^2}$$

Cur Group

2023/24

23/01/2024

Find Area



$$\begin{aligned} \frac{10 \times 12}{2} &= 60 \\ 60 &= 60 \end{aligned}$$

$$\begin{aligned} \frac{10 \times 12}{2} &= 60 \\ 60 &= 60 \end{aligned}$$

$$\begin{aligned} \frac{10 \times 12}{2} &= 60 \\ 60 &= 60 \end{aligned}$$

$$\begin{aligned} \frac{10 \times 12}{2} &= 60 \\ 60 &= 60 \end{aligned}$$

$$\begin{aligned} \frac{10 \times 12}{2} &= 60 \\ 60 &= 60 \end{aligned}$$

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Name _____
IAG 2 - H
BEHL

Michael Plavieior

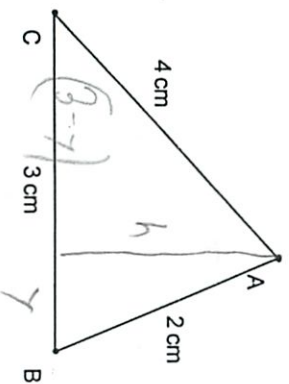
~~1/18/06~~

1/25/06

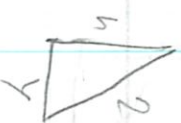
Finding Area with Pythagorean Theorem

Directions: Find the area of each triangle below. Be sure to show all of your work!

1.



$$\begin{aligned} a^2 + b^2 &= c^2 \\ h^2 + (3-y)^2 &= 4^2 \\ -(3-y)^2 - (3-y)^2 \\ h^2 &= 4^2 - (3-y)^2 \end{aligned}$$



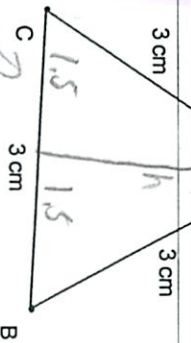
$$\begin{aligned} a^2 + b^2 &= c^2 \\ h^2 + y^2 &= 2^2 \\ -y^2 - y^2 \\ h^2 &= 2^2 - y^2 \end{aligned}$$

$$\begin{aligned} (3-y)(3-y) \\ 9 - 3y - 3y + y^2 \end{aligned}$$

$$\begin{aligned} 4^2 - (3-y)^2 &= 2^2 - y^2 \\ 16 - (9 - 3y - 3y + y^2) &= 4 - y^2 \\ 16 - 9 + 6y - y^2 &= 4 - y^2 \\ + y^2 & \\ 7 + 6y &= 4 \end{aligned}$$

$$\begin{aligned} 7 + 6y &= 4 \\ -7 & \\ 6y &= -3 \\ \frac{6y}{6} &= \frac{-3}{6} \\ y &= -0.5 \end{aligned}$$

$$\begin{aligned} a &= \frac{1}{2}bh \\ a &= \frac{1}{2}(3\text{cm})(1.936\text{cm}) \\ a &= 2.904\text{cm}^2 \end{aligned}$$



because equilateral triangle, sides divided

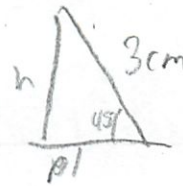
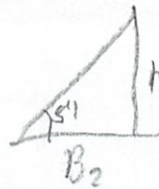
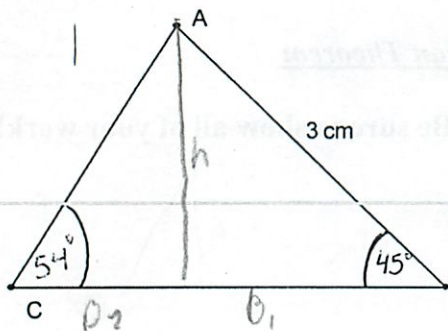


$$\begin{aligned} a^2 + b^2 &= c^2 \\ h^2 + 1.5^2 &= 3^2 \\ h^2 + 2.25 &= 9 \\ -2.25 & \\ h^2 &= 6.75 \end{aligned}$$

$$\begin{aligned} a &= \frac{1}{2}bh \\ a &= \frac{1}{2}(3\text{cm})(2.598\text{cm}) \\ a &= 3.898\text{cm}^2 \\ 3.885\text{cm}^2 \end{aligned}$$

Close ✓

3.



$$\cos(45) = \frac{B_1}{3\text{cm}}$$

$$\sin(45) = \frac{h}{3\text{cm}}$$

$$1.7071(3\text{cm}) = B_1$$

$$2.12 = B_1$$

$$.7071(3\text{cm}) = h$$

$$2.12 = h$$

$$\tan(54) = \frac{h}{B_2}$$

$$1.3763 = \frac{2.12}{B_2}$$

$$1.3763(B_2) = 2.12$$

$$\frac{1.3763}{1.3763} \quad \frac{2.12}{1.3763}$$

$$B_2 = 1.5402$$

$$B_1 + B_2 = B$$

$$2.12 + 1.5402 = 3.6603 = B$$

$$A = \frac{1}{2}bh$$

$$A = \frac{1}{2}(3.6603)(2.12)$$

$$A = 3.88 \text{ cm}^2$$

Michael Plasmeier

Behl
DA62+19

31 Jan 2006

Don't Fence Me In (6)

(33)

1/31/06

300 ft = perimeter
1 rule

In L (ft)	w (ft)	Out Area (ft ²)
20	130	2600
40	110	4400
60	90	5400
80	70	5600
100	50	5000
120	30	3600
140	10	1400

← Almost even
is largest

75 75 5625 ← Square must be
76 74 5624 ← less largest

$$a = l \times w$$

$$a_{\max} = \left(a_{\max} \left(1 + \frac{w}{l} \right) \right)^2$$

$$a = \left(\frac{1}{2} l + w \right)^2$$

$$a = \left(\frac{l + w}{2} \right)^2$$

always 150

$$a = w(150 - w)$$

$$a = 150w - w^2$$

Dr. J. Lee Jr. (V)

1/23/11

3000 ft - 6000 ft

2000 ft - 3000 ft

1000 ft - 2000 ft

500 ft - 1000 ft

1000 ft - 2000 ft

500 ft - 1000 ft

1000 ft - 2000 ft

500 ft - 1000 ft

1000 ft - 2000 ft

Michael Placencia
Behl
2A62H9
31 Jan 2006

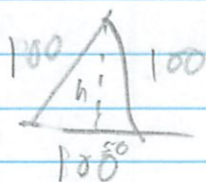
Rectangles are Being
p242

(34)

1/31/06

1. equilateral triangle w/ perimeter of 300 ft

$$300/3 = 100 \text{ ft each side}$$



$$\begin{aligned} 100^2 &= h^2 + 50^2 \\ 10000 &= h^2 + 2500 \\ -2500 & \quad -2500 \\ 7500 &= h^2 \\ \sqrt{\quad} \quad \sqrt{\quad} \\ \boxed{86.6025 = h} \end{aligned}$$

$$\begin{aligned} a &= \frac{1}{2}bh \\ a &= \frac{1}{2}(100)(86.6025) \\ \boxed{a = 4330.1275} \end{aligned}$$

2. Well Mr. Juan, your idea would result 1294.87 less square feet for the horses. I think the horses wouldn't think your design is that cool. Go home!

1/3/20

Fracture on Boring
1/3/20

1/3/20
1/3/20
1/3/20

Fracture on Boring
1/3/20

Fracture on Boring
1/3/20



Fracture on Boring
1/3/20

Fracture on Boring
1/3/20

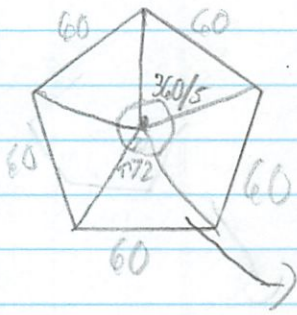
Michael Placiet
Bohl
IA62H9
31 Jan 2006

Regular Pentagon + Hexagon

Coral-Max Area

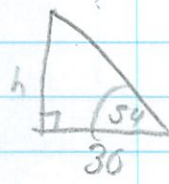
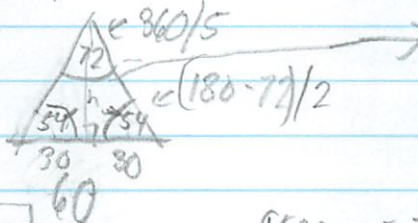
35

1/31/06



300 ft perimeter - find max area

regular pentagon
 $300/5 = 60$ ft each side



$$\tan(36) = \frac{h}{30}$$

$$1.38(30) = h$$

$$41.29 = h$$

$$\text{area } \Delta = \frac{1}{2}bh$$

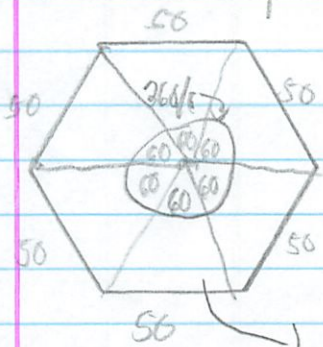
$$a = \frac{1}{2}(60)(41.29)$$

$$a_{\Delta} = 1238.71$$

$$a_{\Delta} \times 5 = a_{\text{pent}} = 6193.72 \text{ ft}^2$$

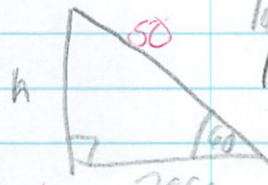
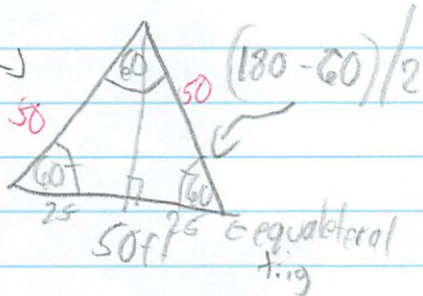
So For

# of sides	Max Area ft ²
3	4330
4	5625
5	6193.5
6	6495.19



300 ft perimeter - find max area

regular hexagon
 $300/6 = 50$ ft each side



$$\tan(30) = \frac{h}{25}$$

$$1.732(25) = h$$

$$43.30 = h$$

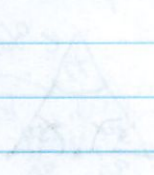
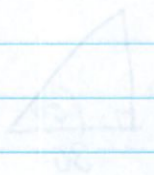
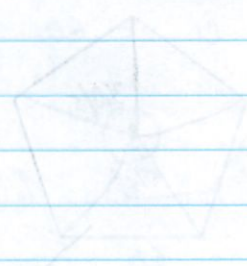
can also pt, Heron

$$\text{area } \Delta = \frac{1}{2}bh$$

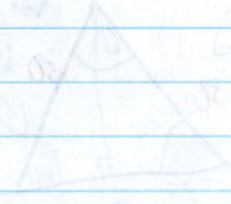
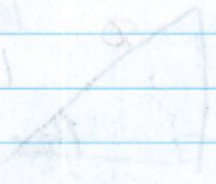
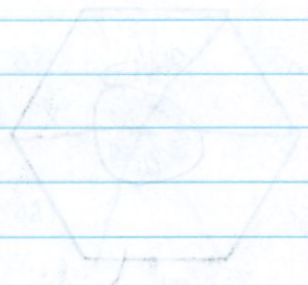
$$a_{\Delta} = \frac{1}{2}(50)(43.30)$$

$$a_{\Delta} = 1082.53$$

$$\text{area } \Delta \times 6 = a_{\text{hex}} = 6495.19 \text{ ft}^2 = \text{area } \bigcirc$$



1000



Answer - (a) 1111000

Michael Plasmior
Behl
IAGDH
2 Feb 2006

More Fencing Bigger Corrals (17)

30/30

2/2/06

1. Find Max area for a 600^{ft} perimeter square

$$600 \text{ ft} / 4 \text{ sides} = 150 \text{ ft sides}$$

$$\text{area max} = \left(\frac{1 \text{ tw}}{2} \right)^2$$

$$\text{area max} = \left(\frac{150 + 150}{2} \right)^2$$

$$\text{area max} = \left(\frac{300}{2} \right)^2$$

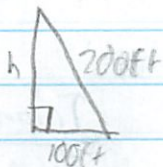
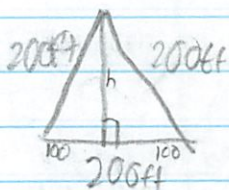
$$\text{area max} = 150^2$$

$$\text{area max} = 22500 \text{ ft}^2 \square$$

Prim.	Area	
300ft	5625ft ²	If greatly increases the amount of area inside the corral (4 times bigger)
600ft	22500ft ²	

2. Find max area for 600 perimeter triangle

$$600 \text{ ft} / 3 \text{ sides} = 200 \text{ ft sides}$$



$$h^2 + 100 \text{ ft}^2 = 200 \text{ ft}^2$$

$$h^2 + 10000 \text{ ft}^2 = 40000 \text{ ft}^2$$

$$-10000 \quad -10000$$

$$h^2 = 30000$$

$$h = 173.21 \text{ ft}$$

$$a = \frac{1}{2}bh$$

$$a = \frac{1}{2}(200 \text{ ft})(173.21 \text{ ft})$$

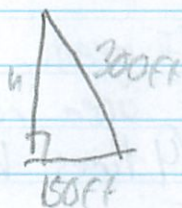
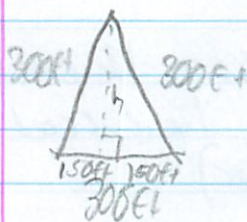
$$a = 17320.51 \text{ ft}^2$$

Prim.	Area	
300ft	4330.127	The area is 4 times bigger again
600ft	17320.51	

3. Find max area 900 prim. square
 $900 \text{ ft} / 4 \text{ sides} = 225 \text{ ft} - \text{side}$

$$\begin{aligned} \text{area max} &= \left(\frac{1 \times w}{2}\right)^2 \\ \text{area max} &= \left(\frac{225 \times 225}{2}\right)^2 \\ \text{area max} &= (225)^2 \\ \text{area max} &= 50625 \text{ ft}^2 \end{aligned}$$

- Find max area 900 perimeter triangle
 $900 \text{ ft} / 3 \text{ sides} = 300 \text{ ft} - \text{side}$



$$\begin{aligned} h^2 + 150^2 &= 300^2 \\ h^2 + 22500 &= 90000 \\ -22500 &-22500 \\ h^2 &= 67500 \end{aligned}$$

$$\begin{aligned} a &= \frac{1}{2}bh \\ a &= \frac{1}{2}(300 \text{ ft})(259.81) \\ a &= 38971.14 \text{ ft}^2 \end{aligned}$$

$$h = 259.81 \text{ ft}$$

4.

Square	
Perimeter	Area
300 ft	5625 ft ²
600 ft	22500 ft ²
900 ft	50625 ft ²

4x 2.25x

Triangle	
Perimeter	Area
300 ft	4330.127 ft ²
600 ft	17320.51 ft ²
900 ft	38971.14 ft ²

2.25x

Used calc
 Avoid ref
 function

$$\begin{aligned} .0625x^2 &= y \\ \frac{1}{16}x^2 &= y \end{aligned}$$

If rounding to tens place,

$$\begin{aligned} y &= .0421x^2 \\ y &= \frac{433}{9000}x^2 \end{aligned}$$

- a- When you double the perimeter the area goes up 4 times
 b- When you triple the perimeter, the area goes up by 9 times
 c- When you 1.5 the area - it goes up by 2.25 times
 d- When you — the area - it goes up by —² times

this is not
 a part of
 the assignment
 but yes it's
 correct

BEES POW

You must be wrong!

typed

Mr. Rotoli went to Home Depot to purchase three sections of fencing to fence in the Senior lounge. He planned to purchase one 6 foot section, one 8 foot section and one 12 foot section. While he was in Home Depot, he ran into Mr. Brown. Mr. Brown asked Mr. Rotoli what he was purchasing. Mr. Rotoli explained that he wanted to purchase fencing to fence in the triangular Senior lounge. After looking at how long each one of Mr. Rotoli's fences were, Mr. Brown quickly told Mr. Rotoli that he should replace the 12 foot section with a 10 foot section. Mr. Brown said that not only will you save money but the area of the Senior lounge would be larger with a 6 foot section, 8 foot section and a 10 foot section. Mr. Rotoli said, "You must be wrong! My three sections of fencing are longer. They must give me a triangle with a larger area!"

Is Mr. Brown as smart as he thinks he is?

*Find 1st area
Find 1st area - rotate sides
Find 2nd area*

Problem Statement: State the problem in mathematical terms

1- copied, incorrect

3- not in mathematical terms

5- correct in mathematical terms

_____ (5)

Process:

4- accurate diagrams of triangles

6- all work for areas shown neatly

_____ (10)

Solution:

6- explanation to finding areas

4- explanation why Mr. Brown is correct or incorrect

_____ (10)

Evaluation:

2- What did you learn from the problem?

2- How would you change the problem?

1- Was the problem too easy or too hard?

_____ (5)

Total

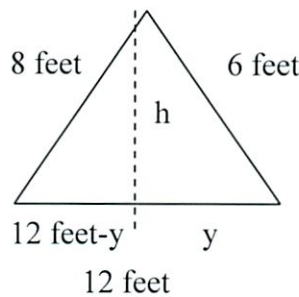
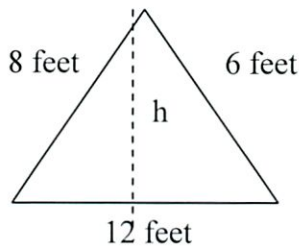
_____ (30)

You Must be Wrong

Bees POW # 2

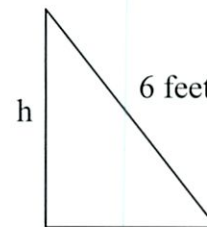
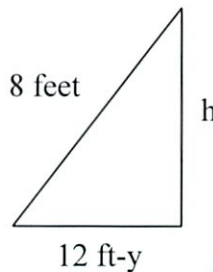
1. *Problem Statement:* In this simple POW you must find the area of two triangles. First, find the area of Dr. Rotoli's original triangle that has side lengths of 6, 8, and 12 feet. Then you must find the area of Mr. Brown's triangle with sides of 6, 8, and 10 feet. You must correctly determine which triangle has the largest area. This problem requires use of the "Crazy Triangle" process done twice.

2. *Process:* I started to solve this easy POW by finding the area of Dr. Rotoli's original triangle. It had side lengths of 6, 8, and 12 feet. I used the "crazy triangle" process that we have learned in class.



I first draw the triangle and insert an imaginary height line down the middle. In order to find the area of this triangle, I must find the height of it first.

I then divide the triangle up into two right triangles. I must split up the base among the two right triangles. To do this I write y on the **shorter** side and $12\text{feet} - y$ on the other side. I will make them equal to each other as I use the Pythagoras theorem to express the triangle as an equation. I must now get h alone to be able to set it equal to the other equation's h ; thereby making both right triangle's equations equal to each other. I do this and then see that there are parentheses in the problem. I must simply these before I can do any thing else to the problem.



$$\begin{aligned} 8\text{feet}^2 &= h^2 + (12\text{feet} - y)^2 \\ 64\text{feet} &= h^2 + (12\text{feet} - y)^2 \\ 64\text{feet} - (12\text{feet} - y)^2 &= h^2 \end{aligned}$$

$$\begin{aligned} 6\text{feet}^2 &= h^2 + y^2 \\ 36\text{feet} &= h^2 + y^2 \\ 36\text{feet} - y^2 &= h^2 \end{aligned}$$

$$64\text{feet} - (12\text{feet} - y)^2 = h^2 = 36\text{feet} - y^2$$

$$\begin{aligned}
 &-(12 \text{ feet} - y)^2 \\
 &-[(12 \text{ feet} - y) - (12 \text{ feet} - y)] \quad \text{correct } \times \\
 &-[(12 \text{ feet} * 12 \text{ feet}) + (12 \text{ feet} * -y) + (-y * 12 \text{ feet}) + (-y * -y)] \\
 &-[(144 \text{ feet}) + (-12y) + (-12y) + (+y^2)] \\
 &-[144 \text{ feet} - 24y + y^2] \\
 &-144 \text{ feet} + 24y - y^2
 \end{aligned}$$

FOIL Process

I simply them by using the FOIL method to get rid of the parentheses.

Now, after I have removed the parentheses from the problem, I can now simply my h^2 equations to find what y or the longer part of the base equals. I find this to be 4.833333 feet.

$$\begin{aligned}
 64 \text{ feet} - (12 \text{ feet} - y)^2 &= h^2 = 36 \text{ feet} - y^2 \\
 64 \text{ feet} - 144 \text{ feet} + 24y - y^2 &= 36 \text{ feet} - y^2 \\
 64 \text{ feet} - 144 \text{ feet} + 24y &= 36 \text{ feet} \\
 -80 \text{ feet} + 24y &= 36 \text{ feet} \\
 +80 \text{ feet} \quad +80 \text{ feet} \\
 24y &= 116 \text{ feet} \\
 y &= 4.833333 \text{ feet}
 \end{aligned}$$

You need to show ALL of the steps. How do you go from 1 line to the next?

operation sign

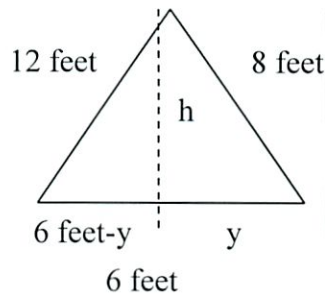
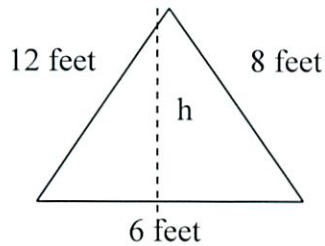
$$\begin{aligned}
 36 \text{ feet} &= h^2 y^2 \\
 36 \text{ feet} &= h^2 (4.833333 \text{ feet})^2 \\
 36 \text{ feet} &= h^2 23.361111 \text{ feet} \\
 12.638888 \text{ feet} &= h^2 \\
 3.555121 \text{ feet} &= h
 \end{aligned}$$

Now I can insert the value for y into one of the right triangle equations to find the height of the big triangle.

Once I have the height I can now simply find the area of Dr. Rotoli's triangle. It is 21.3307 feet^2 .

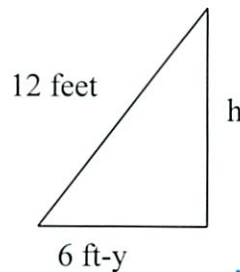
$$\begin{aligned}
 a &= \frac{1}{2}bh \\
 a &= \frac{1}{2}(12 \text{ feet})(3.555121 \text{ feet}) \\
 a &= 21.3307 \text{ feet}^2
 \end{aligned}$$

However, I wonder if my answer would be different if I used different numbers for each side. I will try this just to make sure my answer is always correct.



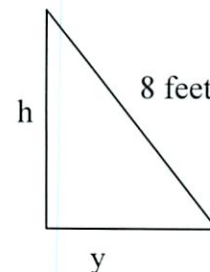
I start again by re-drawing the triangle and insert an imaginary height line down the middle. In order to find the area of this triangle, I must find the height of it first.

I then divide the triangle up into two right triangles. I must split up the base among the two right triangles. To do this I write y on the **shorter** side and $6\text{feet}-y$ on the other side. I will make them equal to each other as I use the Pythagoras theorem to express the triangle as an equation. I must now get h alone to be able to set it equal to the other equation's h ; thereby making both right triangle's equations equal to each other. I do this and then see that there are parentheses in the problem. I must simply these before I can do any thing else to the problem.



operation sign

$$\begin{aligned} 12\text{feet}^2 &= h^2(6\text{feet} - y)^2 \\ 144\text{feet} &= h^2(6\text{feet} - y)^2 \\ 144\text{feet} - (6\text{feet} - y)^2 &= h^2 \end{aligned}$$



operation sign

$$\begin{aligned} 8\text{feet}^2 &= h^2 y^2 \\ 64\text{feet} &= h^2 y^2 \\ 64\text{feet} - y^2 &= h^2 \end{aligned}$$

$$144\text{feet} - (6\text{feet} - y)^2 = h^2 = 64\text{feet} - y^2$$

$$\begin{aligned} &-(6\text{feet} - y)^2 \\ &-[(6\text{feet} - y) - (6\text{feet} - y)] \\ &-[(6\text{feet} * 6\text{feet}) + (6\text{feet} * -y) + (-y * 6\text{feet}) + (-y * -y)] \\ &-[(36\text{feet}) + (-6y) + (-6y) + (+y^2)] \\ &-[36\text{feet} - 12y + y^2] \\ &-36\text{feet} + 12y - y^2 \end{aligned}$$

FOIL Process

I simply them by using the FOIL method to get rid of the parentheses.

2/15/2006

Again, you need to show every step.

Now, after I have removed the parentheses from the problem, I can now simply my h^2 equations to find what y or the longer part of the base equals. I find this to be 9.666666 feet.

6 Foil

$$144 \text{ feet} - (6 \text{ feet} - y)^2 = h^2 = 64 \text{ feet} - y^2$$

$$144 \text{ feet} - 36 \text{ feet} + 12y - y^2 = 64 \text{ feet} - y^2$$

$$144 \text{ feet} - 36 \text{ feet} + 12y = 64 \text{ feet}$$

$$108 \text{ feet} + 12y = 64 \text{ feet}$$

$$12y = -44 \text{ feet}$$

$$y = -3.666666 \text{ feet}$$

$$64 \text{ feet} = h^2 y^2$$

$$64 \text{ feet} = h^2 (-3.66666666 \text{ feet})^2$$

$$64 \text{ feet} = h^2 13.444444 \text{ feet}$$

$$50.5555555 \text{ feet} = h^2$$

$$7.110243 \text{ feet} = h$$

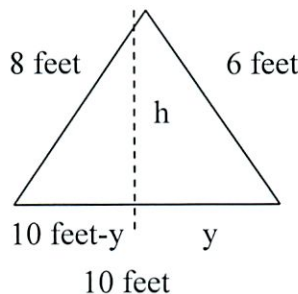
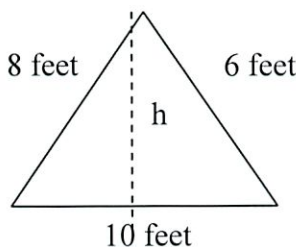
Now I can insert the value for y into one of the right triangle equations to find the height of the big triangle.

Once I have the height I can now simply find the area of Dr. Rotoli's triangle. It is again 21.3307 feet^2 . I can now say that no matter what side is the base or used for the height, the area of the triangle will not change. Knowing this, I can now try to find the area of Mr. Brown's triangle, where he shrinks on e of the sides.

$$a = \frac{1}{2}bh$$

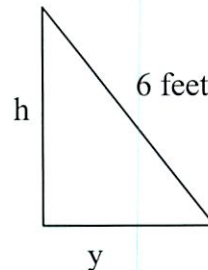
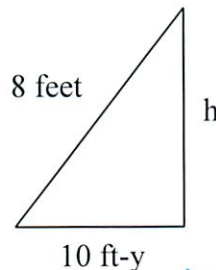
$$a = \frac{1}{2}(6 \text{ feet})(7.110243 \text{ feet})$$

$$a = 21.3307 \text{ feet}^2$$



I start again by drawing the triangle and inserting an imaginary height line down the middle. In order to find the area of this triangle, I must find the height of it first.

I then divide the triangle up into two right triangles. I must split up the base among the two right triangles. To do this I write y on the **shorter** side and $10 \text{ feet} - y$ on the other side. I will make them equal to each other as I use the Pythagoras theorem to express the triangle as an equation.



operation sign

$$8 \text{ feet}^2 = h^2 (10 \text{ feet} - y)^2$$

$$64 \text{ feet} = h^2 (10 \text{ feet} - y)^2$$

$$64 \text{ feet} - (10 \text{ feet} - y)^2 = h^2$$

operation sign

$$6 \text{ feet}^2 = h^2 y^2$$

$$36 \text{ feet} = h^2 y^2$$

$$36 \text{ feet} - y^2 = h^2$$

I must now get h alone to be able to set it equal to the other equation's h ; thereby making both right triangle's equations equal to each other. I do this and then see that there are parentheses in the problem. I must simply these before I can do any thing else to the problem.

I simply them by using the FOIL method to get rid of the parentheses.

$$64 \text{ feet} - (10 \text{ feet} - y)^2 = h^2 = 36 \text{ feet} - y^2$$

$$\begin{aligned} &-(10 \text{ feet} - y)^2 \\ &-[(10 \text{ feet} - y) - (10 \text{ feet} - y)] \\ &-[(10 \text{ feet} * 10 \text{ feet}) + (10 \text{ feet} * -y) + (-y * 10 \text{ feet}) + (-y * -y)] \\ &-[(100 \text{ feet}) + (-10y) + (-10y) + (+y^2)] \\ &-[100 \text{ feet} - 20y + y^2] \\ &-100 \text{ feet} + 20y - y^2 \end{aligned}$$

FOIL Process

Now, after I have removed the parentheses from the problem, I can now simply my h^2 equations to find what y or the longer part of the base equals. I find this to be 9.666666 feet.

$$\begin{aligned} 64 \text{ feet} - (10 \text{ feet} - y)^2 &= h^2 = 36 \text{ feet} - y^2 \\ 64 \text{ feet} - 100 \text{ feet} + 20y - y^2 &= 36 \text{ feet} - y^2 \\ 64 \text{ feet} - 100 \text{ feet} + 20y &= 36 \text{ feet} \\ -36 \text{ feet} + 20y &= 36 \text{ feet} \\ 20y &= 72 \text{ feet} \\ y &= 3.6 \text{ feet} \end{aligned}$$

Need to show EVERY step

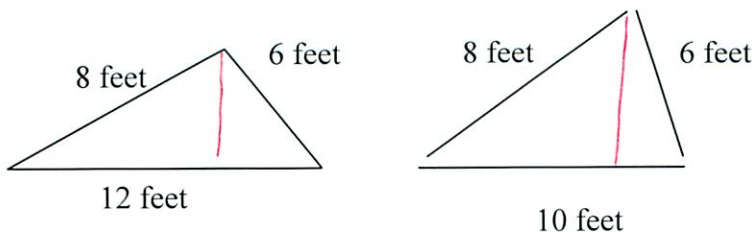
operation sign

$$\begin{aligned} 36 \text{ feet} &= h^2 y^2 \\ 36 \text{ feet} &= h^2 (3.6 \text{ feet})^2 \\ 36 \text{ feet} &= h^2 12.96 \text{ feet} \\ 23.04 &= h^2 \\ 4.8 \text{ feet} &= h \end{aligned}$$

Now I can insert the value for y into one of the right triangle equations to find the height of the big triangle.

$$\begin{aligned} a &= \frac{1}{2}bh \\ a &= \frac{1}{2}(10 \text{ feet})(4.8 \text{ feet}) \\ a &= 24 \text{ feet}^2 \end{aligned}$$

I have now found the area of Mr. Brown's triangle. It is 24 feet^2 . How can that be? A smaller side yields a bigger area? Let me try to understand it by construction exploded-scale models.



I did not change the lengths of the lines from one triangle to the next. I just rotated and re-positioned them.

3. *Solution:* I can see it now. The shorter base results in a much greater angle for the two sides in relation to the base. This also greatly increases the height of the triangle. This results in a bigger area. However, Mr. Brown's triangle is only about 2,6693 feet² bigger than Dr. Rotoli's triangle. So in conclusion, Mr. Brown's triangle has a bigger area even though he has a shorter perimeter. This happens because the shorter base forces a higher height, which increases the area of the triangle enough to overcome the negative effect of shorting the base.

4. *Extension:* Not necessary to do.

5. *Evaluation:* This was an easy problem in knowing exactly what to do in order to solve the problem. Part of the fun of POWs in previous years was that one did not know what steps to take in order to solve the problem. In this POW I knew exactly how to solve the problem. However, there was a lot of math and steps that had to be shown. This takes time to recreate on the computer. I also made a mistake over the weekend where I thought that y goes on the larger side, not the smaller side. However, once I took a look at my notes I could quickly fix my mistakes on the computer. The write up also takes time.

The answer was surprising to me, as I was expecting that Mr. Brown be wrong. I guess we are so involved in rectangles, where a decrease in the perimeter, will decrease the area also. I learned that this is not always the case with triangle. In general, triangles are funny. The Pythagoras theorem, trig and the property that the sum of any 2 sides is larger than the third rules all play a part in contributing to the weirdness of triangles. I think this POW is a good problem because of this surprise answer. However, I do miss having to figure out the method to solve the problem as featured in last year's POWs. I would not change the problem at all, but possibly throw it out and start over. However, that is not likely.

Michael

BEES POW

You must be wrong!

Mr. Rotoli went to Home Depot to purchase three sections of fencing to fence in the Senior lounge. He planned to purchase one 6 foot section, one 8 foot section and one 12 foot section. While he was in Home Depot, he ran into Mr. Brown. Mr. Brown asked Mr. Rotoli what he was purchasing. Mr. Rotoli explained that he wanted to purchase fencing to fence in the triangular Senior lounge. After looking at how long each one of Mr. Rotoli's fences were, Mr. Brown quickly told Mr. Rotoli that he should replace the 12 foot section with a 10 foot section. Mr. Brown said that not only will you save money but the area of the Senior lounge would be larger with a 6 foot section, 8 foot section and a 10 foot section. Mr. Rotoli said, "You must be wrong! My three sections of fencing are longer. They must give me a triangle with a larger area!"

Is Mr. Brown as smart as he thinks he is?

Problem Statement: State the problem in mathematical terms

- 1- copied, incorrect
- 3- not in mathematical terms
- 5- correct in mathematical terms

5 (5)

Process:

- 4- accurate diagrams of triangles
- 6- all work for areas shown neatly

8 ⁻² (10)

Solution:

- 6- explanation to finding areas
- 4- explanation why Mr. Brown is correct or incorrect

10 (10)

Evaluation:

- 2- What did you learn from the problem?
- 2- How would you change the problem?
- 1- Was the problem too easy or too hard?

5 (5)

Total

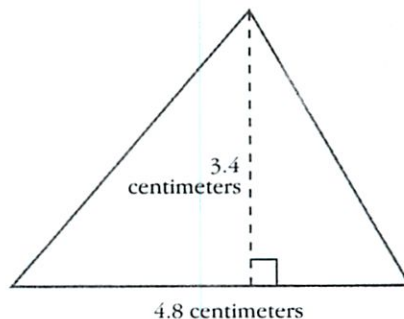
28 ⁻² (30)

What's the Answer Worth?

Sometimes we measure or estimate something and then make calculations based on these estimates. When your original numbers are only approximations, it's important to know how accurate your final answer is.

1. Two students were studying area. They measured the triangle shown here and found its base to be 4.8 centimeters and its altitude to be 3.4 centimeters. Both measurements were found to the nearest tenth of a centimeter.

- What's the maximum that the base could be? What's the maximum that the altitude could be? (Use the fact that the measurements are rounded to the nearest tenth.)
- Use your answers to part a to determine the maximum that the area could be.
- What's the minimum that the area could be?



2. Suppose you are taking a test that shows the figure in Question 1 with no explanation and you are asked to find the area of the triangle. How would you answer?

1. a. The max base = 4.844444 cm
 The max altitude = 3.444444 cm
 b. $a = \frac{1}{2}bh$ $a = \frac{1}{2}(4.844444)(3.444444)$
 $\text{max area} = 8.343269877$
 c. Min base = 4.755555 cm
 Min altitude = 3.355555 cm

Min area = $\frac{1}{2}bh$ $a = \frac{1}{2}(4.755555)(3.355555)$
 $\text{Min area} = 7.978765432$

2. I would use the figures given and use the

Ans variable function from there on to preserve 4 decimal points. I might then copy everything (all 4 decimal points) or provide Sci notation. $a = 8.343269877$

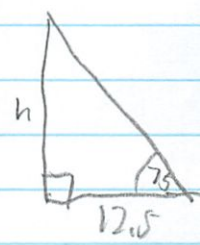
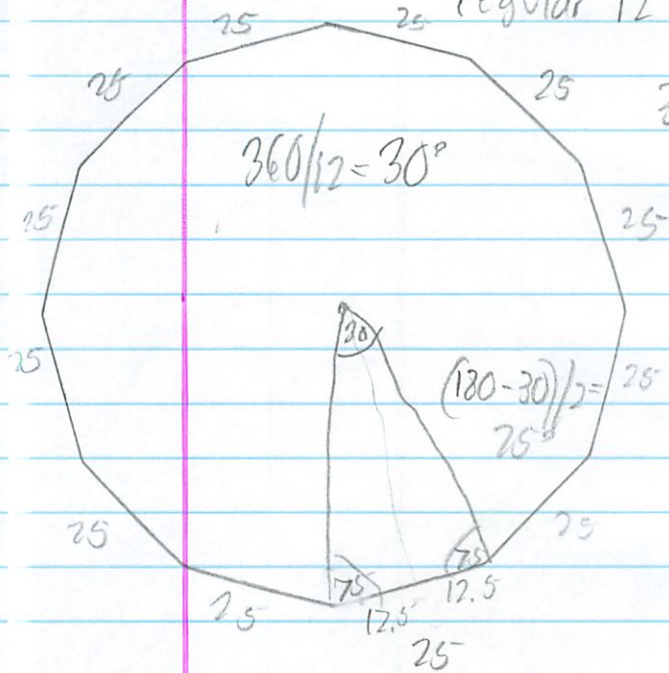
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6 Feb 2006

12-sided Figure Corral

2/6/06

regular 12 sided figure - 300 ft perimeter max

$$300/12 = 25 \text{ ft per side}$$



$$\tan(75) = \frac{h}{12.5}$$

$$3.7320(12.5) = h$$

$$46.6506 \text{ ft} = h$$

Use 25 not 12.5 for height

$$\text{area} = \frac{1}{2}bh$$

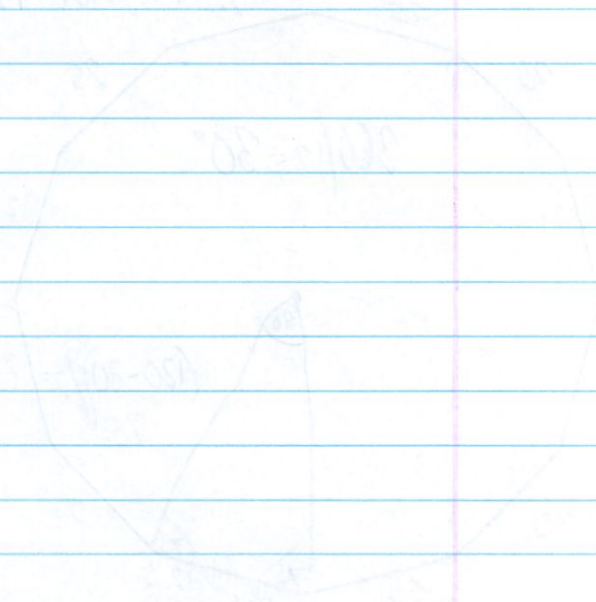
$$a_{\Delta} = 291.5664 \text{ ft}^2$$

$$583.1729 \text{ ft}^2$$

$$a_{\Delta} \times 12 = 3498.7276 \rightarrow 3498.80 \text{ ft}^2$$

$$a_{\Delta} = 6997.5952 \text{ ft}^2$$

area



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Corral Conclusion

(38)

2/6

Hot Sides	ft ² Max Area	300ft perim area rounded 1, hundredths place
3	4330	
4	5625	
5	6193.5	
6	6495	
7	6676.45	
8	6790.48	
9	6896.34	
10	6925.5	
11	6968.28	
12	6997.60	
circle		

What is the best shape for Rancher Gonzalez?

A circle with infinite number of sides
would be the best shape

$$\text{area circle} = \pi r^2$$

$$\text{circumference circle} = \pi d \text{ or } 2\pi r$$

$$\begin{aligned} \text{circ } \frac{300}{2} &= \frac{2\pi r}{2} \\ 150 &= \pi r \\ \frac{150}{\pi} &= \frac{\pi r}{\pi} \\ 47.7465 &= r \end{aligned}$$

$$\begin{aligned} \text{area} &= \pi r^2 \\ &= \pi (47.7465)^2 \\ &= 7161.9724 \text{ ft}^2 \end{aligned}$$

Simply $\sqrt{\quad}$ (18)

(39)

2/6

Should have a/b be perfect squares

1. Is $\sqrt{a+b}$ the same as $\sqrt{a} + \sqrt{b}$?
- $a=5, b=7 \quad \sqrt{5+7} = 3.46 \quad \sqrt{5} + \sqrt{7} = 2.765$ (No) for adding
- $a=17, b=23 \quad \sqrt{17+23} = 6.32 \quad \sqrt{17} + \sqrt{23} = 4.668$ (No)
- $a=1, b=10 \quad \sqrt{1+10} = 3.32 \quad \sqrt{1} + \sqrt{10} = 2.04$ (No)

No for subtracting

2. Is $\sqrt{a \times b}$ the same as $\sqrt{a} \times \sqrt{b}$? Don't forget close parentheses
- $a=5, b=7 \quad \sqrt{5 \times 7} = 5.916 \quad \sqrt{5} \times \sqrt{7} = 5.916$ (Yes) for multiplication
- $a=17, b=23 \quad \sqrt{17 \times 23} = 19.774 \quad \sqrt{17} \times \sqrt{23} = 19.774$ (Yes)
- $a=1, b=10 \quad \sqrt{1 \times 10} = 3.162 \quad \sqrt{1} \times \sqrt{10} = 3.162$ (Yes)

3. Is $\sqrt{\frac{a}{b}}$ the same as $\frac{\sqrt{a}}{\sqrt{b}}$?
- $a=5, b=7 \quad \sqrt{\frac{5}{7}} = .845 \quad \frac{\sqrt{5}}{\sqrt{7}} = .845$ (Yes) for division
- $a=17, b=23 \quad \sqrt{\frac{17}{23}} = .859 \quad \frac{\sqrt{17}}{\sqrt{23}} = .859$ (Yes)
- $a=1, b=10 \quad \sqrt{\frac{1}{10}} = .316 \quad \frac{\sqrt{1}}{\sqrt{10}} = .316$ (Yes)

4. For multiplication and dividing the square root of the answer is the same as the answer of the square root. Therefore it is equivalent.

a. $\sqrt{23} \times \sqrt{3} = 8.30 \quad 5\sqrt{3}$

b. $\sqrt{49} \times \sqrt{5} = 15.65 \quad 7\sqrt{5}$

c. $\sqrt{18} = 4.24 = \sqrt{9} \times \sqrt{2} = 3\sqrt{2}$

d. $\sqrt{9} / \sqrt{4} = 1.5 \quad \frac{3}{2}$

e. $\sqrt{3} / \sqrt{16} = .4330 \quad \frac{\sqrt{3}}{4}$

f. $\sqrt{25} / \sqrt{7} = 1.89 \quad \frac{5}{\sqrt{7}}$

$\sqrt{a+b} \neq \sqrt{a} + \sqrt{b}$

$\sqrt{a-b} \neq \sqrt{a} - \sqrt{b}$

$\sqrt{a \cdot b} = \sqrt{a} \cdot \sqrt{b}$

$\sqrt{\frac{a}{b}} = \frac{\sqrt{a}}{\sqrt{b}}$

When you use $\sqrt{25} \times \sqrt{3}$
say $5\sqrt{3}$ not
a decimal answer

(81)

Simple

Simple

Simple

Simple

Simple

Simple

Simple

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Simple

Name _____
 Period _____
 Date _____

Square Roots

Directions: Simplify these expressions. Leave your answers in fraction form, do not convert into decimals.

1. $\sqrt{72}$
 $\sqrt{14 \times 8}$
 $3\sqrt{8}$ *can be*
 $3\sqrt{4 \times 2}$
 $3 \times 2 \times \sqrt{2}$
 $(6\sqrt{2})$

2. $\sqrt{100}$

(10)

3. $\sqrt{7+9}$
 ~~$\sqrt{18}$~~ $7+9=16$
 $\sqrt{16}$ *addition error*
 (4)

4. $\sqrt{40-4}$

$\sqrt{36}$
 (6)

5. $\sqrt{9 \times 3}$
 $(3\sqrt{3})$

6. $\frac{\sqrt{9}}{16}$

$(\frac{3}{4})$ *can also be converted to regular decimal 0.75*

7. $\frac{\sqrt{8}}{25}$ $\rightarrow \frac{\sqrt{4 \times 2}}{25}$
 $\frac{\sqrt{4} \times \sqrt{2}}{25} \rightarrow \frac{2 \times \sqrt{2}}{25}$
 $(\frac{2\sqrt{2}}{25})$

8. $\sqrt{3+15}$

$\sqrt{18} \rightarrow \sqrt{9 \times 2}$
 $(3\sqrt{2})$

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8 Feb 2006

Falling Bridges (19)

(41)

2/8

It matters how many decimal places you use.

Sam $\rightarrow 1000(99 - 70(1.4)) = 1000$ $\leftarrow \sqrt{2} = 1.414213562$

$1000(99 - 70(1.41)) = 300$

US $\rightarrow 1000(99 - 70(1.414)) = 20$

$1000(99 - 70(1.4142)) = 6$

$1000(99 - 70(1.41421)) = 5.3$

$1000(99 - 70(1.414213)) = 5.09$

$1000(99 - 70(1.4142135)) = 5.055$

$1000(99 - 70(1.41421356)) = 5.0508$

$1000(99 - 70(1.414213562)) = 5.05066$

Big Difference!

Red $\rightarrow 1000(99 - 70(\sqrt{2})) = 5.0506$ $\leftarrow$

(19)

Falling Water

10/10/19
10/10/19
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92

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Feb. 8th, 2006

Square Root Practice

1. Evaluate each of the following:

a. $\sqrt{36} = 6$

i. $\sqrt{81} - \sqrt{25} = 9 - 5 = 4$

b. $\sqrt{225} = 15$

j. $\sqrt{81} - \sqrt{144} = 9 - 12 = -3$

c. $\sqrt{81} + \sqrt{100} = 9 + 10 = 19$

k. $\sqrt{9} + \sqrt{16} = 3 + 4 = 7$

d. $\sqrt{1,000,000} = 1000$

l. $\sqrt{25 \times 9} = \sqrt{25} \sqrt{9} = 5 \times 3 = 15$

e. $\sqrt{9 + 16} = \sqrt{25} = 5$ (can't do $\sqrt{9} + \sqrt{16}$)

m. $\sqrt{10^2 + 5^2} = \sqrt{100 + 25} = \sqrt{125} = 5\sqrt{5}$

f. $\sqrt{25} \times \sqrt{9} = 5 \times 3 = 15$

n. $\sqrt{\frac{100}{16}} = \frac{\sqrt{100}}{\sqrt{16}} = \frac{10}{4} = \frac{5}{2}$

g. $\sqrt{\frac{4}{9}} = \frac{\sqrt{4}}{\sqrt{9}} = \frac{2}{3}$

o. $4 + \sqrt{3^2 + 2^2} = 4 + \sqrt{9 + 4} = 4 + \sqrt{13}$

h. $\sqrt{\frac{16}{81}} = \frac{\sqrt{16}}{\sqrt{81}} = \frac{4}{9}$

p. $\sqrt{(\sqrt{81})} = \sqrt{9} = 3$

2. Evaluate each expression for $x = 3$, $y = -4$ and $z = -7$

$$\begin{array}{llll}
 -\sqrt{3x} & = & -\sqrt{3(3)} & = -\sqrt{9} = -3 \\
 \sqrt{y^2 + 3x} & = & \sqrt{(-4)^2 + 3(3)} & = \sqrt{16+9} = \sqrt{25} = 5 \\
 \sqrt{6x - z} & = & \sqrt{6(3) - (-7)} & = \sqrt{18+7} = \sqrt{25} = 5 \\
 \sqrt{15x \cdot y} & = & \sqrt{15(3) \cdot (-4)} & = \sqrt{45 \cdot (-4)} = \sqrt{-180} \quad \text{division error} \\
 \sqrt{z^2 - 8y} & = & \sqrt{(-7)^2 - 8(-4)} & = \sqrt{49+32} = \sqrt{81} = 9
 \end{array}$$

3. If the area of a square is 289 square mm, calculate the dimensions.

$$\sqrt{289} = 17 \text{ mm} \times 17 \text{ mm}$$

4. If the area of a square is 4.41 square mm, calculate the dimensions.

$$\sqrt{4.41} = 2.1 \text{ mm} \times 2.1 \text{ mm}$$

5. If the area of a square is 0.0081 square mm, calculate the dimensions.

$$\sqrt{0.0081} = 0.09 \text{ mm} \times 0.09 \text{ mm}$$

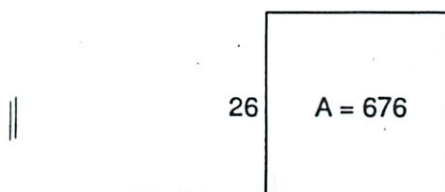
6. If a rectangle has dimensions 4 cm by 16 cm and is equal in area to a second figure which is square. Find the dimensions of the square.

$$4 \text{ cm} \times 16 \text{ cm} = 64 \text{ cm area}$$

$$\sqrt{64} = 8 \text{ cm} \times 8 \text{ cm}$$

Square Roots of Monomials

To find the square root of a number we can think of the number as the area of a square and the square root as the length of a side.

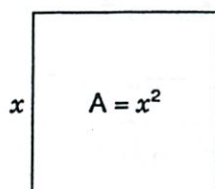


$$\sqrt{676} = 26$$

What would be meant by $\sqrt{x^2}$?

Think of x^2 as the area of a square.

The length of a side must be x , so



$$\sqrt{x^2} = x$$

We can find the square root of any expression that we can write as a square. We will assume that all of our variables stand for positive numbers.

Find each square root by writing the expression as a square.

$$\sqrt{x^{10}} = \sqrt{x^5 \cdot x^5} = x^5$$

(x^5)^2 = x^{10} (cancel out)

$$\sqrt{x^8} = \sqrt{x^4 \cdot x^4} = \sqrt{(x^4)^2} = x^4$$

$$\sqrt{a^{12}} = \sqrt{a^6 \cdot a^6} = \sqrt{(a^6)^2} = a^6$$

$$\sqrt{c^6} = \sqrt{c^3 \cdot c^3} = \sqrt{(c^3)^2} = c^3$$

$$\sqrt{25n^2} = \sqrt{(5n)^2} = 5n$$

(\sqrt{25} \cdot \sqrt{n^2})

$$\sqrt{9y^2} = \sqrt{9 \cdot y^2} = 3y$$

$$\sqrt{100x^2} = \sqrt{100 \cdot x^2} = 10x$$

$$\sqrt{81a^4} = \sqrt{81 \cdot a^2 \cdot a^2} = \sqrt{(9a^2)^2} = 9a^2$$

$$\sqrt{121y^6} = \sqrt{121 \cdot y^6} = 11 \cdot \sqrt{y^3 \cdot y^3} = 11y^3$$

(\sqrt{121} \cdot \sqrt{y^6})

$$\sqrt{x^2y^4} = \sqrt{x^2 \cdot y^2 \cdot y^2} = x \cdot y^2$$

x^2 + (y^2)^2 \rightarrow xy^2

$$\sqrt{a^6b^2} = \sqrt{a^3 \cdot a^3 \cdot b \cdot b} = \sqrt{(a^3b)^2} = a^3b$$

$$\sqrt{n^4m^6} = \sqrt{n^2 \cdot n^2 \cdot m^3 \cdot m^3} = \sqrt{(n^2m^3)^2} = n^2m^3$$

not 2nm^3 because multiplying not adding

The Product and Quotient Rules

Maybe you saw that a simple way to find the square root of a monomial like x^2y^4 is to find the square root of each factor separately. We can do this whenever we have the square root of a product because of the **Product Rule**.

$$\sqrt{ab} = \sqrt{a} \sqrt{b}$$

Use the Product Rule to find each square root.

$\sqrt{4} = 2$ and $\sqrt{x^{10}} = x^5$ $\sqrt{4x^{10}} = \sqrt{4} \sqrt{x^{10}} = 2x^5$	$\sqrt{x^6y^8} = x^3y^4$	$\sqrt{144n^2} = 12n$
$\sqrt{a^4b^4} = a^2b^2$	$\sqrt{p^{10}r^8} = p^5r^4$	$\sqrt{36 \cdot 64} = \sqrt{2304} = 48$
$\sqrt{9 \cdot 10^8} = \sqrt{900000000}$ (30000)	$\sqrt{100x^2} = 10x$	$\sqrt{400c^6} = 20c^3$
$\sqrt{49x^2 \cdot 16y^2} = 7x \cdot 4y$ 28xy (can also be resolved further)	$\sqrt{9m^4 \cdot 36n^2} = 3n^2 \cdot 6n$ 18m ² n (can resolve further)	

By writing the Product Rule the other way around we see that we can use it to multiply square roots as well as to find them.

$$\sqrt{a} \sqrt{b} = \sqrt{ab}$$

Multiply. Write your answer as an integer or a polynomial if you can. Otherwise leave it as a radical expression.

$\sqrt{3} \sqrt{5} = \sqrt{15}$	$\sqrt{3} \sqrt{12} = \sqrt{36} = 6$	$\sqrt{2} \sqrt{72} = \sqrt{2 \times 72} = \sqrt{144} = 12$
$\sqrt{6} \sqrt{6} = \sqrt{6 \times 6} = \sqrt{36} = 6$	$\sqrt{x^3} \sqrt{x^3} = \sqrt{x^3 \times x^3} = \sqrt{(x^3)^2} = x^3$	$\sqrt{3a} \sqrt{3a} = \sqrt{3a \times 3a} = \sqrt{(3a)^2} = 3a$
$\sqrt{2y} \sqrt{8y} = \sqrt{2y \times 8y} = \sqrt{16y^2} = 4y$	$\sqrt{5m} \sqrt{7n} = \sqrt{5m \times 7n} = \sqrt{35mn}$	$\sqrt{3p} \sqrt{5r} = \sqrt{3p \times 5r} = \sqrt{15pr}$
$\sqrt{10} \sqrt{17} = \sqrt{10 \times 17} = \sqrt{170}$	$\sqrt{x} \sqrt{6y} = \sqrt{x \times 6y} = \sqrt{6xy}$	$\sqrt{18} \sqrt{8} = \sqrt{18 \times 8} = \sqrt{144} = 12$

Every quotient can be written as a product, so you might have guessed that there is also a **Quotient Rule** for radicals.

$$\sqrt{\frac{a}{b}} = \frac{\sqrt{a}}{\sqrt{b}} \text{ and } \frac{\sqrt{a}}{\sqrt{b}} = \sqrt{\frac{a}{b}}$$

Use the Quotient Rule to find each square root.

$$\sqrt{\frac{36}{25}} = \frac{6}{5}$$

Handwritten notes: $\sqrt{36} = 6$, $\sqrt{25} = 5$

$$\sqrt{\frac{64}{81}} = \frac{8}{9}$$

Handwritten note: $\sqrt{81} = 9$

$$\sqrt{12\frac{1}{4}} = \sqrt{\frac{49}{4}} = \frac{7}{2}$$

Handwritten note: make mixed #

$$\sqrt{\frac{1}{49}} = \frac{1}{7}$$

Handwritten note: $\sqrt{49} = 7$

$$\sqrt{\frac{144}{900}} = \frac{2}{5}$$

$$\sqrt{2\frac{7}{9}} = \frac{\sqrt{25}}{\sqrt{9}} = \frac{5}{3}$$

Handwritten note: $\sqrt{25} = 5$, $\sqrt{9} = 3$

$$\sqrt{\frac{16}{9}} = \frac{4}{3}$$

$$\sqrt{\frac{121}{289}} = \frac{11}{17}$$

$$\sqrt{1\frac{11}{25}} = \frac{6}{5}$$

$$\sqrt{\frac{81}{100}} = \frac{9}{10}$$

$$\sqrt{\frac{1}{625}} = \frac{1}{25}$$

$$\sqrt{3\frac{1}{16}} = \frac{7}{4}$$

$$\sqrt{\frac{9}{121}} = \frac{3}{11}$$

$$\sqrt{\frac{625}{1849}} = \frac{25}{43}$$

$$\sqrt{1\frac{21}{100}} = \frac{11}{10}$$

Use the Quotient Rule to divide.

$$\frac{\sqrt{45}}{\sqrt{5}} = \sqrt{\frac{45}{5}} = \sqrt{9} = 3$$

$$\frac{\sqrt{6}}{\sqrt{54}} = \sqrt{\frac{6}{54}} = \sqrt{\frac{1}{9}} = \frac{1}{3}$$

$$\frac{\sqrt{80}}{\sqrt{20}} = \sqrt{\frac{80}{20}} = \sqrt{4} = 2$$

$$\frac{\sqrt{8}}{\sqrt{50}} = \sqrt{\frac{8}{50}} = \sqrt{\frac{4}{25}} = \frac{2}{5}$$

$$\frac{\sqrt{80}}{\sqrt{5}} = \sqrt{\frac{80}{5}} = \sqrt{16} = 4$$

$$\frac{\sqrt{150}}{\sqrt{6}} = \sqrt{\frac{150}{6}} = \sqrt{25} = 5$$

$$\frac{\sqrt{75}}{\sqrt{3}} = \sqrt{\frac{75}{3}} = \sqrt{25} = 5$$

$$\frac{\sqrt{11}}{\sqrt{44}} = \sqrt{\frac{11}{44}} = \sqrt{\frac{1}{4}} = \frac{1}{2}$$

Do you think there might be similar rules for adding and subtracting square roots? What would they look like? Write your ideas here, and check whether you think these rules are true or not true.

Addition Rule: _____ true ☐ not true ☐

Subtraction Rule: _____ true ☐ not true ☐

Substitute some numbers for the variables you used in your rules to see whether the rules seem for work for all numbers.

We can easily find approximations for sums and differences of square roots by using the $\sqrt{\quad}$ key on a calculator. On some calculators you must use the memory to store one square root while you compute the other. It is easiest to find the second square root first.

Use a calculator to find an approximation to the nearest hundredth.

Find this first and store it.

Press $\boxed{6} \boxed{\sqrt{\quad}} \boxed{M+}$.

$$\sqrt{42} - \sqrt{16} \approx$$

Next find this. Then subtract what is stored. Press $\boxed{4} \boxed{2} \boxed{\sqrt{\quad}} \boxed{-} \boxed{MR} \boxed{=}$.

$$\sqrt{18} + \sqrt{82} \approx$$

$$\sqrt{28} + \sqrt{12} \approx$$

$$\sqrt{546} - \sqrt{23} \approx$$

$$\sqrt{8.3} + \sqrt{8.3} \approx$$

$$\sqrt{15} - \sqrt{6} \approx$$

$$\sqrt{2} + \sqrt{3} \approx$$

$$\sqrt{5} - \sqrt{30} \approx$$

$$\sqrt{9.36} + \sqrt{5.55} \approx$$

$$\sqrt{.032} - \sqrt{.111} \approx$$

$$\sqrt{10.1} + \sqrt{15.3} \approx$$

As you probably discovered, $\sqrt{a+b}$ is not always equal to $\sqrt{a} + \sqrt{b}$ and $\sqrt{a-b}$ may not equal $\sqrt{a} - \sqrt{b}$. We can't always combine square roots by addition or subtraction. Sometimes we can do it by using the Product and Quotient Rules to simplify the square roots.

Simplifying the square root of a whole number means finding an equivalent expression with the smallest possible number under the radical sign. This is called writing the number in **simplest radical form**.

To write a square root in simplest radical form we first find the largest possible square factor of the number under the radical sign. Then we use the Product Rule.

Look at this example.

$4, 9$ and 16 are squares less than 20 .
 4 is the only one which is a divisor of 20 .

$$\sqrt{20} = \sqrt{4 \cdot 5} = \sqrt{4} \sqrt{5} = 2\sqrt{5}$$

Rewrite each square root in simplest radical form.

$\sqrt{18} = \sqrt{9} \sqrt{2} = 3\sqrt{2}$	$\sqrt{32} =$
$\sqrt{500} =$	$\sqrt{24} =$
$\sqrt{50} =$	$\sqrt{8} =$

If a number is large it is sometimes helpful to find its prime factors.

$\sqrt{80} = \sqrt{\underbrace{2 \cdot 2}_4 \cdot \underbrace{2 \cdot 2}_4 \cdot 5} = \sqrt{4^2 \cdot 5} = 4\sqrt{5}$	$\sqrt{162} =$
$\sqrt{48} =$	$\sqrt{108} =$
$\sqrt{216} =$	$\sqrt{405} =$
$\sqrt{605} =$	$\sqrt{96} =$

Now we have a way to add some square roots — those that can be expressed as like terms. $\sqrt{12}$ and $\sqrt{75}$ can be combined because they can be written as $2\sqrt{3}$ and $5\sqrt{3}$. These are like terms, as $2x$ and $5x$ are. We use the Distributive Property to combine them.

$$\begin{aligned} & \sqrt{12} + \sqrt{75} \\ &= 2\sqrt{3} + 5\sqrt{3} \\ &= 7\sqrt{3} \end{aligned}$$

$2\sqrt{3} + 5\sqrt{3}$
 $= (2 + 5)\sqrt{3}$

Simplify and combine like terms.

$\sqrt{8} + \sqrt{18}$ $\sqrt{4}\sqrt{2} + \sqrt{9}\sqrt{2}$ $2\sqrt{2} + 3\sqrt{2}$ $5\sqrt{2}$	$\sqrt{12} + \sqrt{27}$ $\sqrt{3}\sqrt{4} + \sqrt{3}\sqrt{9}$ $2\sqrt{3} + 3\sqrt{3}$	$\sqrt{63} + \sqrt{28}$ $\sqrt{9}\sqrt{7} + \sqrt{4}\sqrt{7}$ $3\sqrt{7} + 2\sqrt{7}$ $5\sqrt{7}$
$\sqrt{500} - \sqrt{20}$ <i>must be same</i> $\sqrt{5}\sqrt{100} - \sqrt{4}\sqrt{5}$ $10\sqrt{5} - 2\sqrt{5}$ <i>must be perfect sq.</i> $8\sqrt{5}$	$\sqrt{24} - \sqrt{54}$ $\sqrt{4}\sqrt{6} - \sqrt{9}\sqrt{6}$ $2\sqrt{6} - 3\sqrt{6}$ $-1\sqrt{6}$	$\sqrt{27} + \sqrt{300}$ $\sqrt{9}\sqrt{3} + \sqrt{3}\sqrt{100}$ $3\sqrt{3} + 10\sqrt{3}$ $13\sqrt{3}$
$\sqrt{250} - \sqrt{40}$ $\sqrt{25}\sqrt{10} - \sqrt{10}\sqrt{4}$ $5\sqrt{10} - 2\sqrt{10}$ $3\sqrt{10}$	$\sqrt{144} - \sqrt{64}$ $12 - 8$ 4	$\sqrt{32} + \sqrt{50}$ $\sqrt{2}\sqrt{16} + \sqrt{25}\sqrt{2}$ $4\sqrt{2} + 5\sqrt{2}$ $9\sqrt{2}$
$\sqrt{99} - \sqrt{44}$ $\sqrt{9}\sqrt{11} - \sqrt{4}\sqrt{11}$ $3\sqrt{11} - 2\sqrt{11}$ $1\sqrt{11}$	$\sqrt{242} + \sqrt{18}$ $\sqrt{121}\sqrt{2} + \sqrt{2}\sqrt{9}$ $11\sqrt{2} + 3\sqrt{2}$ $14\sqrt{2}$	$\sqrt{160} - \sqrt{90}$ $\sqrt{16}\sqrt{10} - \sqrt{9}\sqrt{10}$ $4\sqrt{10} - 3\sqrt{10}$ $1\sqrt{10}$
$\sqrt{2} + \sqrt{8} + \sqrt{32}$ $\sqrt{2}\sqrt{1} + \sqrt{2}\sqrt{4} + \sqrt{2}\sqrt{16}$ $1\sqrt{2} + 2\sqrt{2} + 4\sqrt{2}$ $7\sqrt{2}$	$\sqrt{3} - \sqrt{27}$ $\sqrt{3}\sqrt{1} - \sqrt{3}\sqrt{9}$ $1\sqrt{3} - 3\sqrt{3}$ $-2\sqrt{3}$	$\sqrt{1000} + \sqrt{40}$ $\sqrt{100}\sqrt{10} + \sqrt{4}\sqrt{10}$ $10\sqrt{10} + 2\sqrt{10}$ $12\sqrt{10}$

Rewrite each square root in simplest radical form. Combine like terms if possible.

$$\begin{aligned} &\sqrt{50} + 3\sqrt{8} \\ &\sqrt{25}\sqrt{2} + 3\sqrt{4}\sqrt{2} \\ &5\sqrt{2} + 3 \cdot 2\sqrt{2} \\ &5\sqrt{2} + 6\sqrt{2} \\ &11\sqrt{2} \end{aligned}$$

$$\begin{aligned} &2\sqrt{12} + \sqrt{75} \\ &2\sqrt{4 \times 3} + \sqrt{25 \times 3} \\ &2 \times 2\sqrt{3} + 5\sqrt{3} \\ &4\sqrt{3} + 5\sqrt{3} \\ &9\sqrt{3} \end{aligned}$$

$$\begin{aligned} &4\sqrt{20} - \sqrt{45} \\ &4\sqrt{4 \times 5} - \sqrt{9 \times 5} \\ &4 \times 2\sqrt{5} - 3\sqrt{5} \\ &8\sqrt{5} - 3\sqrt{5} \\ &5\sqrt{5} \end{aligned}$$

$$\begin{aligned} &3\sqrt{28} + \sqrt{63} \\ &3\sqrt{7 \times 4} + \sqrt{7 \times 9} \\ &3\sqrt{7} \sqrt{2} + \sqrt{7} \sqrt{3} \\ &6\sqrt{7} + 3\sqrt{7} \\ &9\sqrt{7} \end{aligned}$$

$$\begin{aligned} &5 + \sqrt{45} + \sqrt{75} \\ &5 + \sqrt{9 \times 5} + \sqrt{15 \times 5} \\ &5 + 3\sqrt{5} + \sqrt{15} \sqrt{5} \\ &5 + 3\sqrt{5} + \sqrt{3} \sqrt{5} \sqrt{5} \\ &5 + 3\sqrt{5} + \sqrt{3} \sqrt{5^2} \text{ simplify } \sqrt{5^2} = 5 \\ &5 + 3\sqrt{5} + 5\sqrt{3} \text{ further } \sqrt{5^2} = 5 \\ &5 + 3\sqrt{5} + 5\sqrt{3} \end{aligned}$$

$$\begin{aligned} &3\sqrt{200} - \sqrt{800} \\ &3\sqrt{2 \times 100} - \sqrt{8 \times 100} \\ &3\sqrt{2} \sqrt{10} - \sqrt{8} \sqrt{10} \\ &3\sqrt{2} \sqrt{10} - \sqrt{4 \times 2} \sqrt{10} \\ &30\sqrt{2} - \sqrt{4} \sqrt{2} \times 10 \\ &30\sqrt{2} - 2\sqrt{2} \times 10 \\ &30\sqrt{2} - 20\sqrt{2} \\ &10\sqrt{2} \end{aligned}$$

$$\begin{aligned} &5\sqrt{12} + 7\sqrt{27} \\ &5\sqrt{3 \times 4} + 7\sqrt{3 \times 9} \\ &5\sqrt{3} \sqrt{2} + 7\sqrt{3} \sqrt{3} \\ &5\sqrt{3} \sqrt{2} + 7\sqrt{3} \times 3 \\ &10\sqrt{3} + 21\sqrt{3} \\ &31\sqrt{3} \end{aligned}$$

$$\begin{aligned} &2\sqrt{2} + 4\sqrt{4} + 8\sqrt{8} \\ &2\sqrt{2} + 4 \times 2 + 8\sqrt{4 \times 2} \\ &2\sqrt{2} + 8 + 8 \times 2\sqrt{2} \\ &2\sqrt{2} + 8 + 16\sqrt{2} \\ &8 + 18\sqrt{2} \\ &26\sqrt{2} \end{aligned}$$

$$\begin{aligned} &9\sqrt{11} - 3\sqrt{44} + \sqrt{99} \\ &9\sqrt{11} - 3\sqrt{4 \times 11} + \sqrt{9 \times 11} \\ &9\sqrt{11} - 3 \times 2\sqrt{11} + 3\sqrt{11} \\ &9\sqrt{11} - 6\sqrt{11} + 3\sqrt{11} \\ &3\sqrt{11} + 3\sqrt{11} \\ &6\sqrt{11} \end{aligned}$$

$$\begin{aligned} &\sqrt{4x} + \sqrt{9x} \\ &\sqrt{4} \sqrt{x} + \sqrt{9} \sqrt{x} \\ &2\sqrt{x} + 3\sqrt{x} \\ &5\sqrt{x} \end{aligned}$$

$$\begin{aligned} &\sqrt{32x} - \sqrt{18x} \\ &\sqrt{32} \sqrt{x} - \sqrt{18} \sqrt{x} \\ &\sqrt{16 \times 2} \sqrt{x} - \sqrt{9 \times 2} \sqrt{x} \\ &4\sqrt{2} \sqrt{x} - 3\sqrt{2} \sqrt{x} \\ &\sqrt{2} \sqrt{x} \\ &\sqrt{2x} \end{aligned}$$

$$\begin{aligned} &\sqrt{5x^2} + \sqrt{6x^2} \\ &\sqrt{5} \sqrt{x \times x} + \sqrt{6} \sqrt{x \times x} \\ &\sqrt{5} \sqrt{x} \sqrt{x} + \sqrt{6} \sqrt{x} \sqrt{x} \\ &\sqrt{5} \sqrt{x^2} + \sqrt{6} \sqrt{x^2} \text{ keep } x^2 \text{ because } \sqrt{x^2} = x \\ &\sqrt{5} \times x + \sqrt{6} \times x \\ &x\sqrt{5} + x\sqrt{6} \end{aligned}$$

A fraction is in simplest radical form if we can write it as a rational number times the square root of a whole number. This means that the only radical is in the numerator, and it is in simplest form.

$\frac{2\sqrt{3}}{5}$ is in simplest radical form. The radical sign is in the numerator.

$\frac{2}{5\sqrt{3}}$ is not in simplest radical form. The radical sign is in the denominator.

We could write $\frac{2\sqrt{3}}{5}$ as $\frac{2}{5}\sqrt{3}$.

Circle the numbers which are in simplest radical form.

$$\frac{3\sqrt{2}}{10}$$

$$\frac{\sqrt{6}}{4}$$

$$\frac{1}{\sqrt{5}}$$

$$\frac{3}{8}\sqrt{7}$$

$$\frac{5\sqrt{3}}{\sqrt{7}}$$

$$\frac{2}{7\sqrt{7}}$$

$$\frac{\sqrt{8}}{\sqrt{3}}$$

$$\frac{2}{\sqrt{11}}$$

$$\frac{4\sqrt{5}}{11}$$

$$\frac{3}{\sqrt{3}}$$

$$\frac{\sqrt{15}}{15}$$

$$\frac{\sqrt{12}}{12}$$

Use the Quotient Rule. Then simplify the numerator and denominator. Circle the result if it is in simplest radical form.

$$\sqrt{\frac{12}{25}} = \frac{\sqrt{12}}{\sqrt{25}} = \frac{\sqrt{4}\sqrt{3}}{5} = \frac{2\sqrt{3}}{5}$$

$$\sqrt{\frac{8}{9}} = \frac{\sqrt{8}}{\sqrt{9}} = \frac{\sqrt{4}\sqrt{2}}{3} = \frac{2\sqrt{2}}{3}$$

$$\sqrt{\frac{3}{4}} = \frac{\sqrt{3}}{\sqrt{4}} = \frac{\sqrt{3}}{2}$$

$$\sqrt{\frac{4}{27}} = \frac{\sqrt{4}}{\sqrt{27}} = \frac{2}{\sqrt{9}\sqrt{3}} = \frac{2}{3\sqrt{3}} \rightarrow \frac{2\sqrt{3}}{9}$$

Good form

$$\sqrt{\frac{3}{5}} = \frac{\sqrt{3}}{\sqrt{5}}$$

$$\sqrt{\frac{45}{4}} = \frac{\sqrt{9}\sqrt{5}}{\sqrt{4}} = \frac{3\sqrt{5}}{2}$$

$$\sqrt{\frac{1}{2}} = \frac{\sqrt{1}}{\sqrt{2}} = \frac{1}{\sqrt{2}}$$

$$\sqrt{\frac{1}{12}} = \frac{\sqrt{1}}{\sqrt{12}} = \frac{1}{\sqrt{4}\sqrt{3}} = \frac{1}{2\sqrt{3}} \rightarrow \frac{\sqrt{3}}{6}$$

For ne

$$\sqrt{\frac{25}{48}} = \frac{\sqrt{25}}{\sqrt{48}} = \frac{5}{\sqrt{16}\sqrt{3}} = \frac{5}{4\sqrt{3}}$$

$$\sqrt{\frac{24}{49}} = \frac{\sqrt{6}\sqrt{4}}{\sqrt{7}\sqrt{7}} = \frac{2\sqrt{6}}{7}$$

There is a simple trick we can use to change a fraction which is not in simplest radical form to one that is. We multiply by 1. Look at this example.

$$\frac{7}{\sqrt{2}} \cdot \boxed{\frac{\sqrt{2}}{\sqrt{2}}} = \frac{7\sqrt{2}}{\sqrt{2}\sqrt{2}} = \frac{7\sqrt{2}}{\sqrt{4}} = \frac{7\sqrt{2}}{2}$$

Do you see why multiplying $\sqrt{2}$ by itself gets rid of the square root sign? Rewrite each fraction in simplest radical form.

$$\frac{3\sqrt{5}}{\sqrt{5}\sqrt{5}} = \frac{3\sqrt{5}}{\sqrt{25}} = \frac{3\sqrt{5}}{5}$$

$$\frac{7}{\sqrt{2}} =$$

$$\frac{1}{\sqrt{3}} =$$

$$\frac{4\sqrt{2}}{\sqrt{2}\sqrt{2}} = \frac{4\sqrt{2}}{\sqrt{4}} = \frac{4\sqrt{2}}{2} = 2\sqrt{2}$$

$$\frac{3}{\sqrt{3}} =$$

$$\frac{10}{\sqrt{5}} =$$

$$\frac{8}{\sqrt{6}} =$$

$$\frac{3}{2\sqrt{7}} =$$

$$\frac{1}{5\sqrt{2}} =$$

$$\frac{\sqrt{5}\sqrt{5}}{\sqrt{3}\sqrt{3}} =$$

$$\frac{\sqrt{2}}{\sqrt{11}} =$$

$$\frac{\sqrt{3}}{\sqrt{6}} =$$

$$\frac{\sqrt{10}}{\sqrt{5}} =$$

$$\frac{2\sqrt{3}}{\sqrt{2}} =$$

Use the Quotient Rule. Write the answer in simplest radical form.

$$\sqrt{\frac{1}{3}} =$$

$$\sqrt{\frac{4}{3}} =$$

$$\sqrt{\frac{4}{5}} =$$

$$\sqrt{\frac{7}{16}} =$$

$$\sqrt{\frac{5}{6}} =$$

$$\sqrt{\frac{1}{10}} =$$

$$\sqrt{\frac{3}{8}} =$$

$$\sqrt{\frac{10}{3}} =$$

$$\sqrt{\frac{8}{9}} =$$

$$\sqrt{\frac{16}{25}} =$$

$$\sqrt{\frac{31}{32}} =$$

$$\sqrt{\frac{x}{4}} =$$

$$\sqrt{\frac{9}{x}} =$$

$$\sqrt{\frac{x^2}{3}} =$$

$$\sqrt{\frac{c^2}{5}} =$$

$$\sqrt{\frac{2}{a}} =$$

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 Feb. 23, 2006

14, 9, 16, 25, 36, 49, 64, 81, 100, 121, 144, 169, 196, 225
 $\frac{64}{65}$

Square Root and Inverse Trig Quiz

Directions: Simplify each expression to the lowest term(s).

1. $\sqrt{81} a^4 \sqrt{81} \times \sqrt{a^4} = 9 \cdot \sqrt{a^4} = 9a^2$
2. $\sqrt{64} c^6 \sqrt{64} \times \sqrt{c^4} = 8 \cdot \sqrt{c^4} \times c^3 = 8 \sqrt{c^4} \times c^3 = 8c^3$
3. $\sqrt{x^4} m^8 \sqrt{x^2} \times \sqrt{x^2} \times \sqrt{m^4} \times \sqrt{m^4} = \sqrt{x^2} \times \sqrt{m^4} = x^2 m^4$
4. $\sqrt{18} \sqrt{8} \sqrt{18 \times 8} \sqrt{144} = 12$
5. $\sqrt{7} \sqrt{7} \sqrt{7 \times 7} = \sqrt{49} = 7$
6. $\sqrt{3 \frac{1}{16}} \sqrt{3 \frac{1}{16}} = \sqrt{\frac{49}{16}} = \frac{7}{4}$
7. $\sqrt{2 \frac{7}{9}} \sqrt{2 \frac{7}{9}} = \frac{25}{9} \frac{\sqrt{25}}{\sqrt{9}} = \frac{5}{3}$
8. $\sqrt{150/6} \sqrt{150/6} = \frac{\sqrt{150}}{\sqrt{6}} = \frac{\sqrt{6} \cdot \sqrt{25}}{\sqrt{6}} = \frac{5\sqrt{6}}{\sqrt{6}} = 5$
9. $\sqrt{22/44} \sqrt{22/44} = \frac{\sqrt{22}}{\sqrt{44}} = \frac{\sqrt{22}}{\sqrt{4} \sqrt{11}} = \frac{\sqrt{22}}{2\sqrt{11}} = \frac{\sqrt{2} \sqrt{11}}{2\sqrt{11}} = \frac{\sqrt{2}}{2}$
10. $\sqrt{27} + \sqrt{30} \sqrt{3} \sqrt{9} + \sqrt{3} \sqrt{10} = 3\sqrt{3} + 3\sqrt{3} = 6\sqrt{3}$
11. $\sqrt{160} - \sqrt{90} \sqrt{16} \sqrt{10} - \sqrt{9} \sqrt{10} = 4\sqrt{10} - 3\sqrt{10} = \sqrt{10}$
12. $\sqrt{2} + 8\sqrt{8} + \sqrt{32} \sqrt{2} + 8\sqrt{4} \sqrt{2} + \sqrt{16} \sqrt{2} = \sqrt{2} + 8 \times 2 \times \sqrt{2} + 4\sqrt{2} + 16\sqrt{2} + 4\sqrt{2} = 21\sqrt{2}$
13. $\sqrt{24} - \sqrt{54} \sqrt{6} \sqrt{4} - \sqrt{9} \sqrt{6} = 2\sqrt{6} - 3\sqrt{6} = -\sqrt{6}$
14. $4\sqrt{20} - \sqrt{45} 4\sqrt{4} \sqrt{5} - \sqrt{9} \sqrt{5} = 4 \times 2\sqrt{5} - 3\sqrt{5} = 8\sqrt{5} - 3\sqrt{5} = 5\sqrt{5}$
15. $\sqrt{50} + 3\sqrt{8} \sqrt{25} \sqrt{2} + 3\sqrt{4} \sqrt{2} = 5\sqrt{2} + 3 \times 2\sqrt{2} + 5\sqrt{2} + 6\sqrt{2} = 11\sqrt{2}$
16. $\sqrt{9x} + \sqrt{16x} \sqrt{9} \sqrt{x} + \sqrt{16} \sqrt{x} = 3\sqrt{x} + 4\sqrt{x} = 7\sqrt{x}$
17. $\sqrt{4/27} \sqrt{4/27} = \frac{\sqrt{4}}{\sqrt{27}} = \frac{2}{\sqrt{9} \sqrt{3}} = \frac{2}{3\sqrt{3}}$
18. $\sqrt{25/48} \sqrt{25/48} = \frac{\sqrt{25}}{\sqrt{48}} = \frac{5}{\sqrt{16} \sqrt{3}} = \frac{5}{4\sqrt{3}}$
19. $\sqrt{x^2/54} \sqrt{x^2/54} = \frac{\sqrt{x^2}}{\sqrt{54}} = \frac{x}{\sqrt{9} \sqrt{6}} = \frac{x}{3\sqrt{6}}$
20. $\sqrt{a^6} \sqrt{a^6} = \sqrt{a^6 \times a^6} = \sqrt{a^{12}} = a^6$

#9 Redo

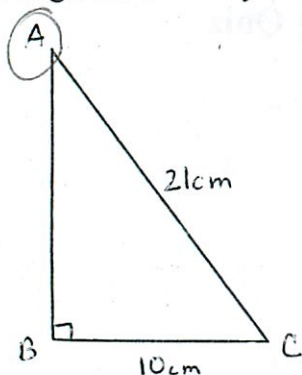
$$\sqrt{\frac{22}{44}} \sqrt{\frac{22}{44}} = \frac{\sqrt{2} \sqrt{11}}{\sqrt{4} \sqrt{11}} = \frac{\sqrt{2} \sqrt{11}}{2 \sqrt{11}} = \frac{\sqrt{2}}{2}$$

-1

Calc #9 $\frac{1}{2\sqrt{2}}$

Directions: Use what you have learned about Trig and Inverse Trig to solve these problems. Be sure to show ALL of your work if you want to receive full credit!

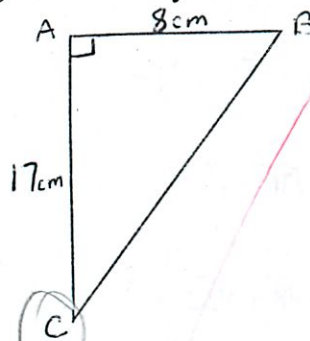
21. Find angle A. Round your answer to the nearest degree



$$\sin(A) = \frac{10 \text{ cm}}{21 \text{ cm}}$$

$$\sin^{-1}(10/21) = 28^\circ$$

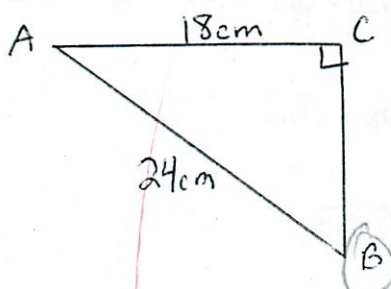
22. Find angle c. Round your answer to the nearest degree



$$\tan(c) = \frac{8 \text{ cm}}{17 \text{ cm}}$$

$$\tan^{-1}(8/17) = 25^\circ$$

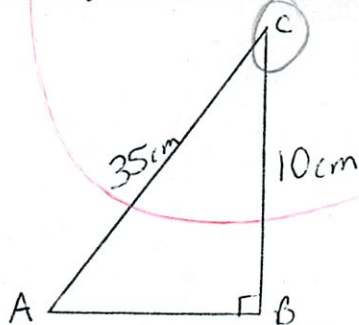
23. Find angle B. Round your answer to the nearest degree



$$\sin(B) = \frac{18 \text{ cm}}{24 \text{ cm}}$$

$$\sin^{-1}(18/24) = 49^\circ$$

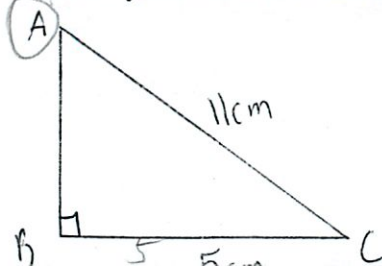
24. Find angle c. Round your answer to the nearest degree



$$\cos(c) = \frac{10 \text{ cm}}{35 \text{ cm}}$$

$$\cos^{-1}(10/35) = 73^\circ$$

25. Find angle A. Round your answer to the nearest degree



$$\sin(A) = \frac{5 \text{ cm}}{11 \text{ cm}}$$

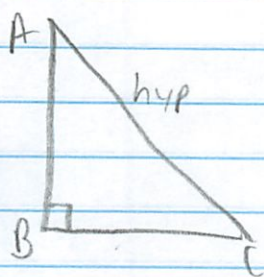
$$\sin^{-1}(5/11) = 27^\circ$$

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DAG2H9
16 Feb 2006

Inverse Trig Notes

44

2/6



Regular

$$\sin = \frac{\text{opp}}{\text{hyp}}$$
$$\cos = \frac{\text{adj}}{\text{hyp}}$$
$$\tan = \frac{\text{opp}}{\text{adj}}$$

helps
us find
side lengths

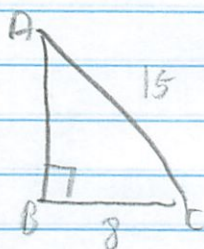
Inverse

$$\sin^{-1} = \frac{\text{opp}}{\text{hyp}}$$
$$\cos^{-1} = \frac{\text{adj}}{\text{hyp}}$$
$$\tan^{-1} = \frac{\text{opp}}{\text{adj}}$$

helps us
find angles

Just different
on calculator

Example

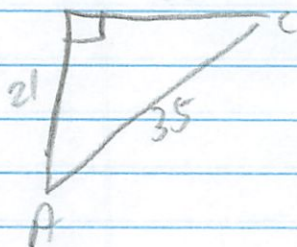


Find $\angle A$

$$\sin(\angle A) = \frac{8}{15}$$

$$\sin^{-1}\left(\frac{8}{15}\right) = 32.23^\circ \text{ on calculator}$$

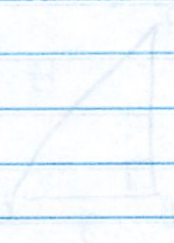
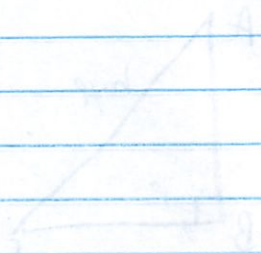
Example 2



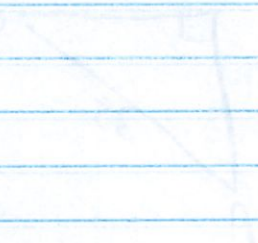
Find $\angle C$

$$\sin(\angle C) = \frac{21}{35}$$

$$\sin^{-1}\left(\frac{21}{35}\right) = 36.87^\circ$$



Example 2



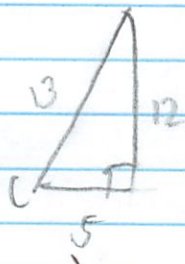
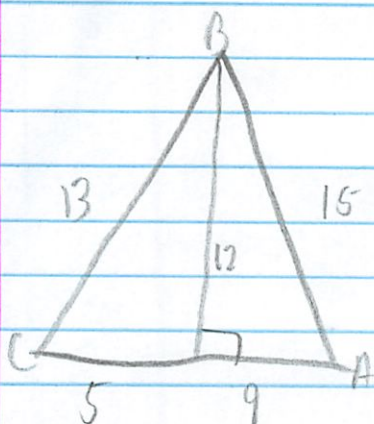
Michael Plasmeier
Bohl
TAG 2+19

16 Feb 2006

Le'lise's Floral Angles (20)

(45)

2/16



Find $\angle C$

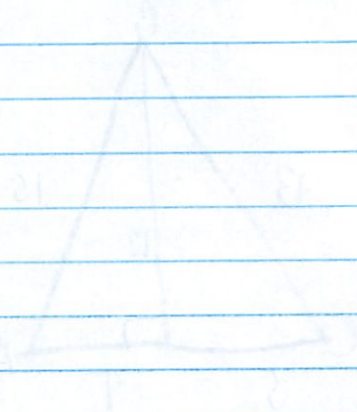
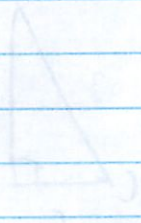
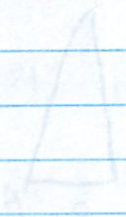
$$\cos(\angle C) = \frac{5}{13}$$
$$\cos^{-1}\left(\frac{5}{13}\right) = 67^\circ$$



Find $\angle A$

$$\cos(\angle A) = \frac{9}{15}$$
$$\cos^{-1}\left(\frac{9}{15}\right) = 53^\circ$$

$$\text{Find } \angle B = 180 - (\angle A + \angle C)$$
$$180 - 120$$
$$60^\circ = \angle B$$



$$\begin{aligned} \sin(\theta) &= \frac{3}{5} \\ \cos(\theta) &= \frac{4}{5} \end{aligned}$$

$$\begin{aligned} \sin(\theta) &= \frac{12}{20} = \frac{3}{5} \\ \cos(\theta) &= \frac{16}{20} = \frac{4}{5} \end{aligned}$$

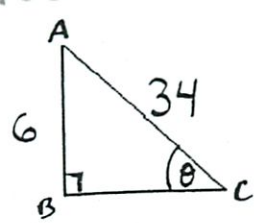
Inverse Trig Worksheet

Name Michael Plasmora
Period _____
Date 2/16

State each trigonometric ration in terms of the sides of a right triangle.

$\sin A = \frac{\text{opp}}{\text{hyp}}$ $\cos A = \frac{\text{adj}}{\text{hyp}}$ $\tan A = \frac{\text{opp}}{\text{adj}}$

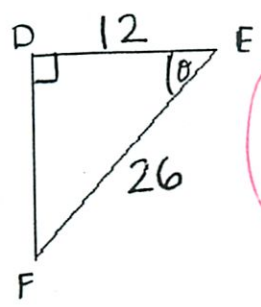
Round
to nearest
degree



Find angle C

$\sin C = \frac{6}{34}$
 $\sin^{-1}(6/34) = 10^\circ$ *make sure to label*

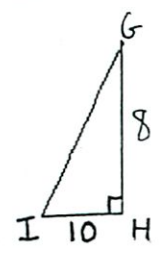
2)



Find angle E

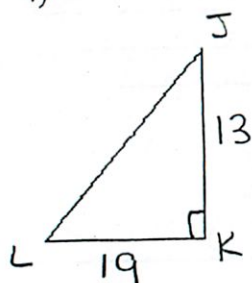
$\cos E = \frac{12}{26}$
 $\cos^{-1}(12/26) = 63^\circ$

3)



$\tan I = \frac{8}{10}$
Find angle I $\tan^{-1}(8/10) = 39^\circ$

4)



Find angle J

~~$\tan J = \frac{13}{19}$~~

$$\frac{\text{Opp}}{\text{adj}} = \frac{13}{19}$$

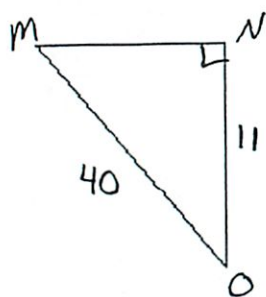
~~$\tan^{-1}(13/19)$~~

$$\tan^{-1}(19/13)$$

~~34°~~

$$56^\circ \text{ C}$$

5)



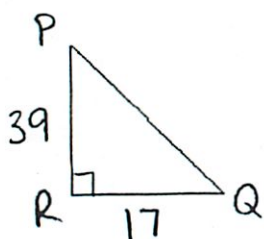
Find angle M

$$\sin M = \frac{11}{40}$$

$$\sin^{-1}(11/40) = 16^\circ$$

C

6)



Find angle Q

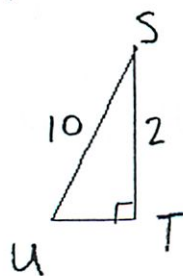
$$\tan Q = \frac{39}{17}$$

$$\tan^{-1}(39/17)$$

$$67^\circ$$

round up

7)



Find angle S

$$\cos S = \frac{2}{10}$$

$$\cos^{-1}(2/10)$$

$$79^\circ$$

round up

Name Michael Plasencia Date _____ Class _____

Lesson 4 Worksheet 2

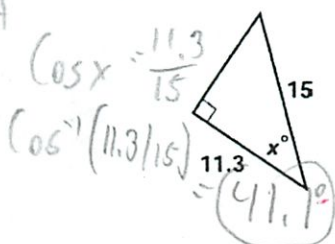
Using inverse trig ratios to solve for an angle in a right triangle

Part I: Use your calculator and inverse trig functions to find the angle for each ratio below to the nearest tenth (round to 1 decimal place).

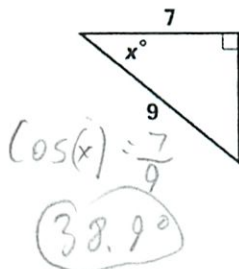
- | | | |
|---|---|--|
| 1. $\sin^{-1} .86 = \underline{59.3}$ | 5. $\cos^{-1} .72 = \underline{43.9}$ | 9. $\tan^{-1} .53 = \underline{27.9}$ |
| 2. $\sin^{-1} \frac{5}{8} = \underline{38.7}$ | 6. $\cos^{-1} \frac{1}{8} = \underline{82.8}$ | 10. $\tan^{-1} 2 = \underline{63.4}$ |
| 3. $\sin^{-1} .5 = \underline{30.0}$ | 7. $\cos^{-1} .3 = \underline{72.5}$ | 11. $\tan^{-1} 4.6 = \underline{77.7}$ |
| 4. $\sin x = \frac{3}{4}, x = \underline{48.6}$ | 8. $\cos x = \frac{1}{2}, x = \underline{60.0}$ | 12. $\tan x = \frac{7}{8}, x = \underline{42.1}$ |

Part II: Solve for x in each triangle below. Use what you learned in lesson 3 to first identify the ratio, then write the equation, and then solve the equation. Make sure your calculator is in degree mode. Round your answers to the nearest tenth.

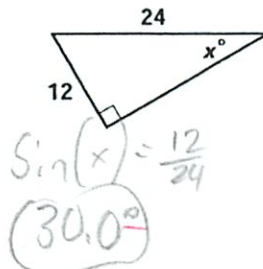
1.



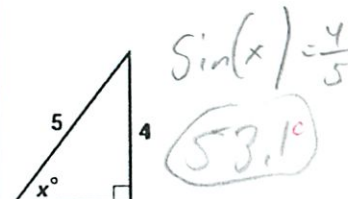
2.



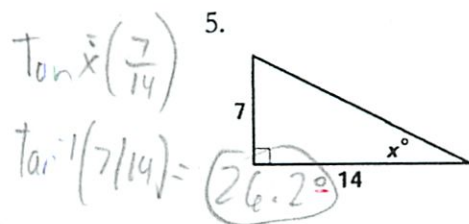
3.



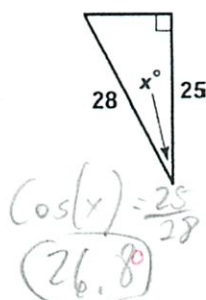
4.



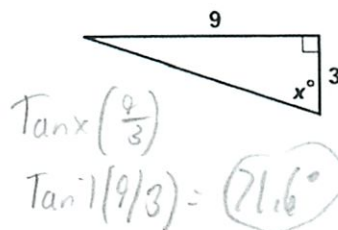
5.



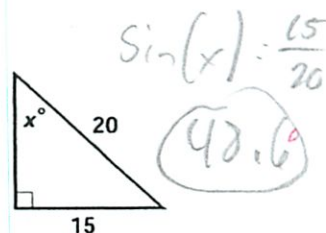
6.



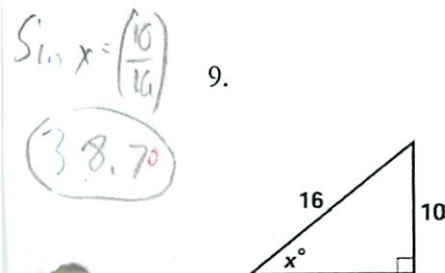
7.



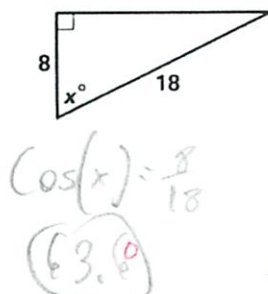
8.



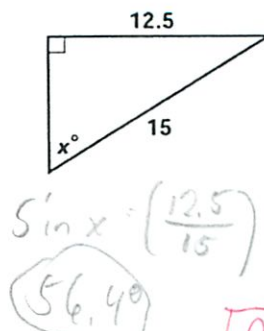
9.



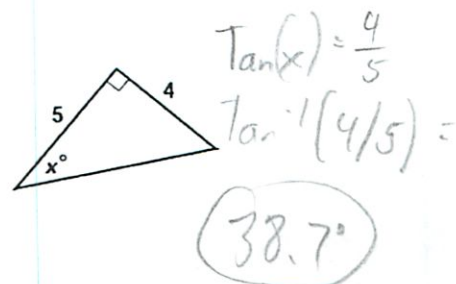
10.



11.



12.



Remember Degree Sign!

Michael Plasmeier

Bohl
IAG 2+19

1 March 2006

Square Root Practice

3/1/06

$$1. \sqrt{121y^6} \rightarrow \sqrt{121} \sqrt{y^6} \rightarrow 11 \sqrt{y^3 \times y^3} \quad 11 / (y^3)^2 \quad (11y^3)^2 \quad \leftarrow \text{no } \sqrt{\text{sign}}$$

$$2. \sqrt{a^{12}b^4} \rightarrow \sqrt{a^6 \times a^6} \times \sqrt{b^2 \times b^2} \quad \sqrt{(a^6)^2} \times \sqrt{(b^2)^2} \quad (a^6b^2)$$

$$3. \sqrt{\frac{121}{100}} \quad \frac{\sqrt{121}}{\sqrt{100}} \quad \frac{\sqrt{121}}{\sqrt{100}} \quad \left(\frac{11}{10}\right) \quad \leftarrow \text{good!} \quad \frac{11}{10}$$

$$4. \sqrt{\frac{625}{1849}} \quad \frac{\sqrt{625}}{\sqrt{1849}} \quad \left(\frac{25}{43}\right)$$

$$5. \sqrt{\frac{25}{3}} \quad \frac{\sqrt{25}}{\sqrt{3}} \quad \frac{\sqrt{25} \times \sqrt{3}}{\sqrt{3}} \quad \frac{5\sqrt{3}}{\sqrt{3}} \rightarrow (5) \quad \leftarrow \times 25$$

$$6. \sqrt{\frac{80}{20}} \quad \frac{\sqrt{80}}{\sqrt{20}} \quad \frac{\sqrt{8} \sqrt{10}}{\sqrt{2} \sqrt{10}} \quad \frac{\sqrt{8}}{\sqrt{2}} \quad \frac{\sqrt{4} \sqrt{2}}{\sqrt{2}} \quad \frac{2\sqrt{2}}{1} \quad (2)$$

$$7. \sqrt{96} \rightarrow \sqrt{24} \sqrt{4} \quad (2\sqrt{24}) \quad \sqrt{6} \sqrt{4} \quad 2 \times 2 \sqrt{6} \quad (4\sqrt{6}) \quad \leftarrow \text{easier}$$

$$8. \sqrt{216} \rightarrow \sqrt{36} \sqrt{6} \quad (6\sqrt{6})$$

$$9. 9\sqrt{11} - 3\sqrt{44} - \sqrt{99} \rightarrow 9\sqrt{11} - 3\sqrt{11}\sqrt{4} - \sqrt{9}\sqrt{11} \\ 9\sqrt{11} - 3 \times 2\sqrt{11} - 3\sqrt{11} \rightarrow 9\sqrt{11} - 6\sqrt{11} - 3\sqrt{11} \quad (0)$$

$$10. \sqrt{\frac{45}{4}} \quad \frac{\sqrt{45}}{\sqrt{4}} \quad \frac{\sqrt{5} \sqrt{9}}{\sqrt{4}} \quad \left(\frac{3\sqrt{5}}{2}\right)$$

Spoken English Practice

11/11/2006

Topic: My Mother

My mother is a very kind and loving person.

She always takes care of me and my family.

She is very hardworking and dedicated.

She always encourages me to study hard.

She is a very good cook and loves to cook for me.

She is a very good friend and always helps me when I am in trouble.

She is a very good mother and I love her very much.

My mother is a very good person and I am very lucky to have her.

She is a very good mother and I love her very much.

Michael Plosmeier
Behl
IAG ZH9
3 March 2006

Square Root Check-up Quiz

40
40

3/3

✓ 1. $\sqrt{80} \rightarrow \sqrt{16} \sqrt{5} \rightarrow (4\sqrt{5})$

✓ 2. $\sqrt{207} \rightarrow \sqrt{9} \sqrt{23} \rightarrow (3\sqrt{23})$

✓ 3. $\sqrt{\frac{625}{1849}} \rightarrow \frac{\sqrt{625}}{\sqrt{1849}} \rightarrow (\frac{25}{43})$

✓ 4. $\sqrt{12} + \sqrt{27} \rightarrow \sqrt{4} \sqrt{3} + \sqrt{9} \sqrt{3} \rightarrow 2\sqrt{3} + 3\sqrt{3} \rightarrow (5\sqrt{3})$

✓ 5. $\sqrt{7x^2} + \sqrt{5x^2} \rightarrow \sqrt{7} \sqrt{x^2} + \sqrt{5} \sqrt{x^2} \rightarrow (\sqrt{7}x + \sqrt{5}x)$
if it's
but can it
go lower

✓ 6. $4\sqrt{20} - \sqrt{45} \rightarrow 4\sqrt{4} \sqrt{5} - \sqrt{9} \sqrt{5} \rightarrow 4 \times 2\sqrt{5} - 3\sqrt{5} \rightarrow$
 $8\sqrt{5} - 3\sqrt{5} = (5\sqrt{5})$

✓ 7. $\sqrt{27} + \sqrt{300} \rightarrow \sqrt{3} \sqrt{9} + \sqrt{3} \sqrt{100} \rightarrow 3\sqrt{3} + 10\sqrt{3} \rightarrow (13\sqrt{3})$

✓ 8. $\sqrt{\frac{33}{44}} \rightarrow \frac{\sqrt{33}}{\sqrt{44}} \rightarrow \frac{\sqrt{11} \sqrt{3}}{\sqrt{11} \sqrt{4}} \rightarrow \frac{\sqrt{3} \sqrt{11}}{2\sqrt{11}} \rightarrow (\frac{\sqrt{3}}{2}) \text{ (or } \frac{1}{2\sqrt{3}})$

✓ 9. $\sqrt{1\frac{11}{25}} \rightarrow \sqrt{\frac{36}{25}} \rightarrow \frac{\sqrt{36}}{\sqrt{25}} \rightarrow (\frac{6}{5})$

✓ 10. $\sqrt{12\frac{1}{4}} \rightarrow \sqrt{\frac{49}{4}} \rightarrow \frac{\sqrt{49}}{\sqrt{4}} \rightarrow (\frac{7}{2})$

✓ 11. $\sqrt{144x^{16}} \rightarrow \sqrt{144} \times \sqrt{x^8} \times \sqrt{x^8} \rightarrow 12 \sqrt{(x^8)^2} \rightarrow (12x^8)$

✓ 12. $\sqrt{\frac{304}{475}} \rightarrow \frac{\sqrt{304}}{\sqrt{475}} \rightarrow \frac{\sqrt{16} \sqrt{19}}{\sqrt{25} \sqrt{19}} \rightarrow \frac{4\sqrt{19}}{5\sqrt{19}} \rightarrow (\frac{4}{5})$

over

$$\checkmark 13. \sqrt{\frac{192}{81}} \rightarrow \frac{\sqrt{192}}{\sqrt{81}} \rightarrow \frac{\sqrt{33 \cdot 4}}{9} \rightarrow \left(\frac{2\sqrt{33}}{9} \right)$$

the square root is
part of the
numerator
~~or $\frac{2}{9\sqrt{33}}$~~ they are
=

$$\checkmark 14. \sqrt{2x} + \sqrt{8x} + \sqrt{18x} + \sqrt{32x} \rightarrow \sqrt{2}\sqrt{x} + \sqrt{8}\sqrt{x} + \sqrt{18}\sqrt{x} + \sqrt{32}\sqrt{x}$$

$$\sqrt{2}\sqrt{x} + \sqrt{4}\sqrt{2}\sqrt{x} + \sqrt{9}\sqrt{2}\sqrt{x} + \sqrt{16}\sqrt{2}\sqrt{x}$$

$$(1)\sqrt{2}\sqrt{x} + 2\sqrt{2}\sqrt{x} + 3\sqrt{2}\sqrt{x} + 4\sqrt{2}\sqrt{x}$$

$$(10\sqrt{2x})$$

$$\checkmark 15. 9\sqrt{18x^2} - 3\sqrt{50x^4} \rightarrow 9\sqrt{9}\sqrt{2}\sqrt{x^2} - 3\sqrt{50}\sqrt{x^4} \rightarrow$$

$$9 \times 3\sqrt{2}x - 3\sqrt{25}\sqrt{2}x^2 \rightarrow$$

$$27x\sqrt{2} - 3(5)\sqrt{2}x^2 \rightarrow$$

$$27x^2\sqrt{2} - 15x^2\sqrt{2} \rightarrow (12x^2\sqrt{2})$$

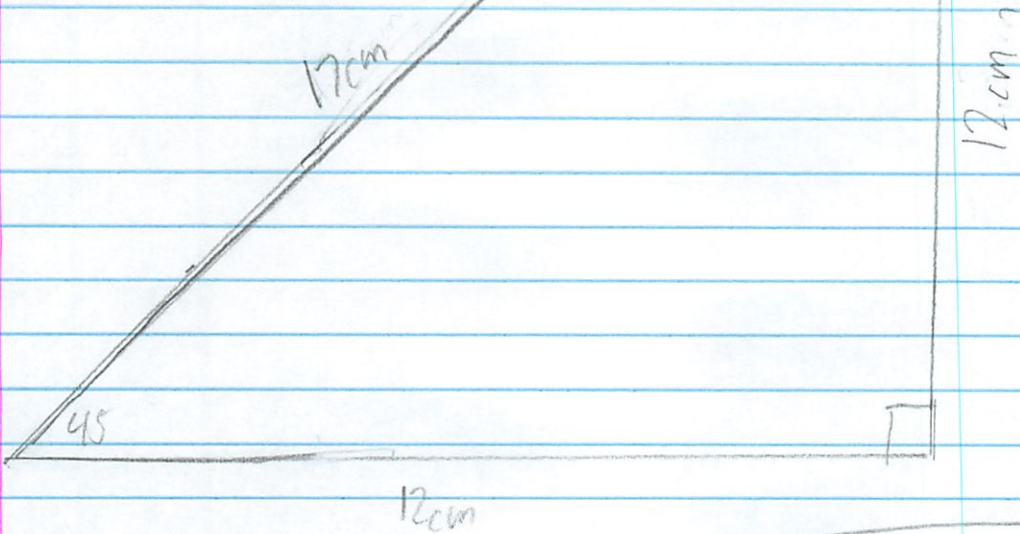
Michael Plasmeyer
Behl
IAG2H9
1 March 2006

Special Right Triangles

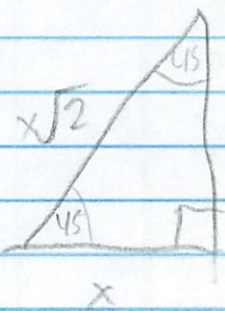
3/1

- 45-45-90 Right Triangle $\rightarrow$

The 2 legs are = lengths

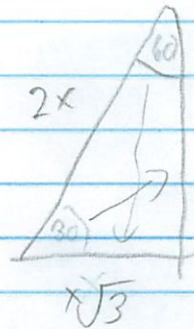


45-45-90



x is always the legs
 $x\sqrt{2}$ is always hyp.

30-60-90

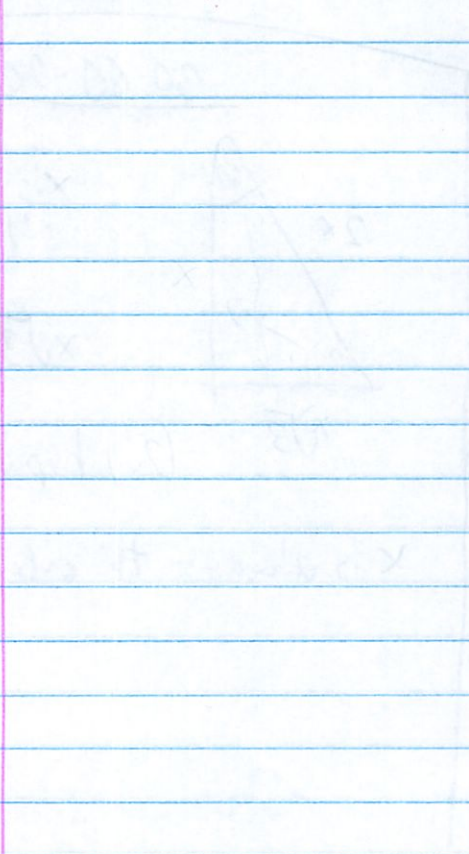
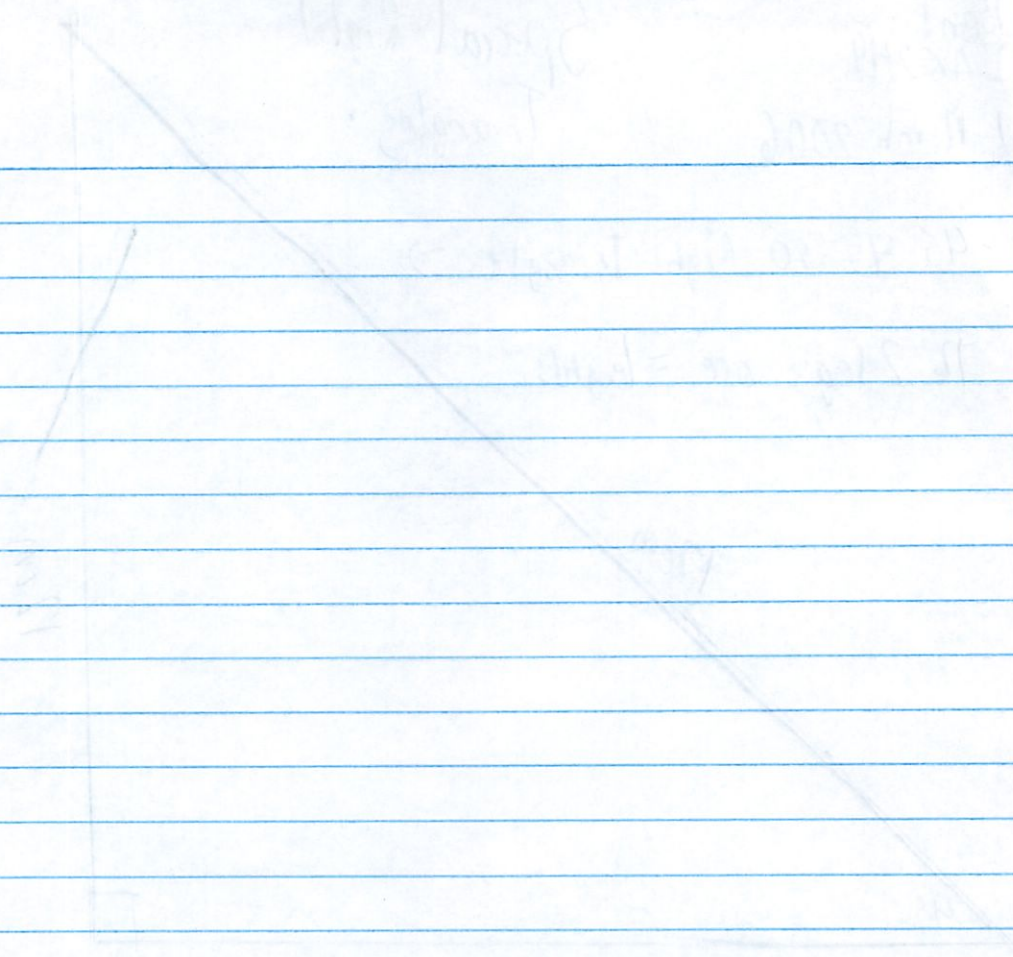


x is always the side opposite 30°

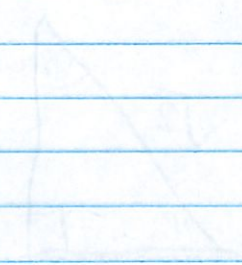
$x\sqrt{3}$ is opposite 60°

(2x) hyp is opp 90°

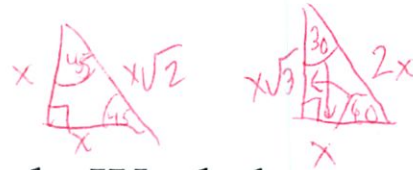
x is always the side opp



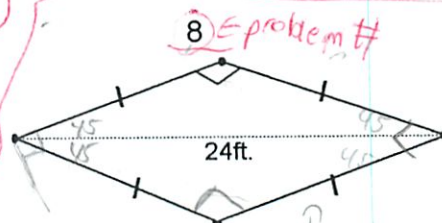
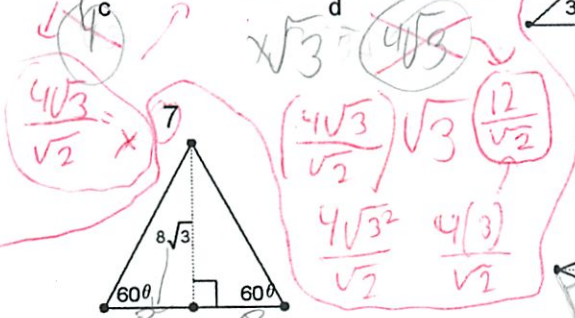
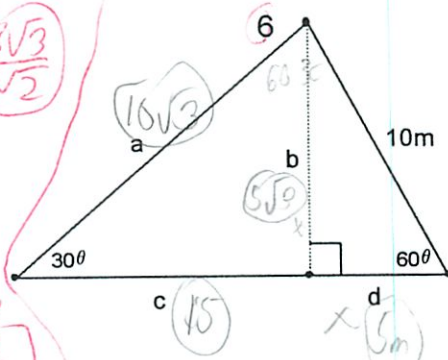
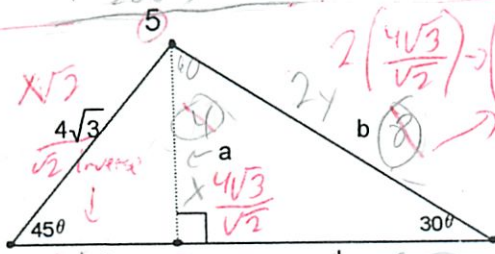
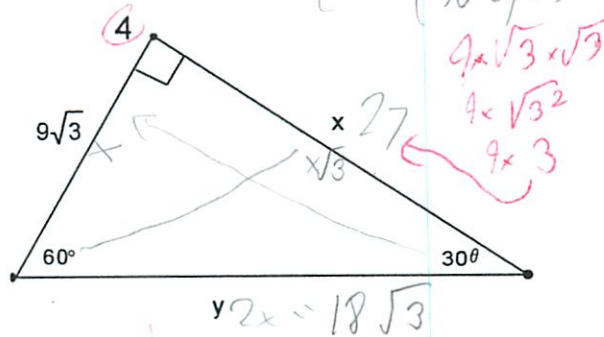
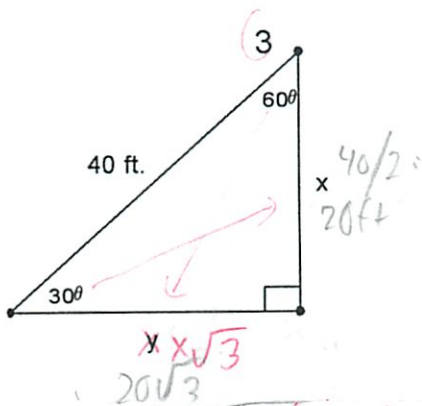
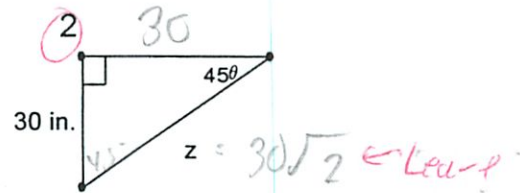
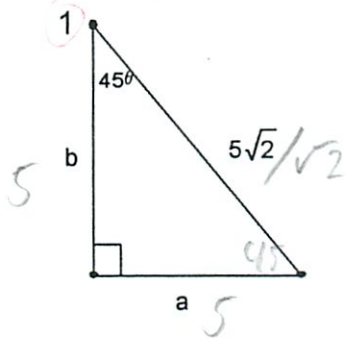
$OP = 12.90$



Michael Ploemeier



Special Right Triangle Worksheet



Find the area of the triangle.

$$A = \frac{1}{2}bh$$

$$A = \frac{1}{2}(8+8)8\sqrt{3}$$

$$A = 8(8\sqrt{3})$$

$$A = 64\sqrt{3}$$

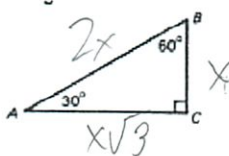
$$24 \times \sqrt{2} \rightarrow \frac{24}{\sqrt{2}} = \text{each side}$$

$$\frac{24 \times \sqrt{2}}{\sqrt{2} \times \sqrt{2}} \rightarrow \frac{24\sqrt{2}}{2} \rightarrow 12\sqrt{2}$$

Michael Plasmeier

Special Right Triangles Worksheet

Exercises 1-6 refer to the 30-60-90 triangle. Using the given information, find the indicated length.



1. $AB=14$; $BC=7$

2. $BC=7$; $AB=14$

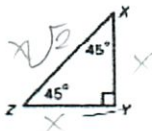
3. $BC=8$; $AC=8\sqrt{3}$

4. $AB=16$; $AC=8\sqrt{3}$

5. $AC=9\sqrt{3}$; $BC=9$

6. $AC=4\sqrt{3}$; $AB=8$

Exercises 7-12 refer to the 45-45-90 triangle. Using the given information, find the indicated length.



7. $XY=7$; $XZ=7\sqrt{2}$

8. $YZ=10$; $XZ=10\sqrt{2}$

9. $XZ=11\sqrt{2}$; $YZ=11$

10. $XZ=10$; $XY=10/\sqrt{2} \rightarrow \frac{10}{\sqrt{2}} \rightarrow 7(2) \rightarrow 14$

11. $YZ=7\sqrt{2}$; $XZ=(7\sqrt{2})\sqrt{2} \rightarrow 7\sqrt{2}^2 \rightarrow 7$

12. $XZ=12$; $YZ=12/\sqrt{2} \rightarrow \frac{10}{\sqrt{2}}$

13. The length of the hypotenuse of a 30-60-90 triangle is 20. What is the length of the shorter leg?

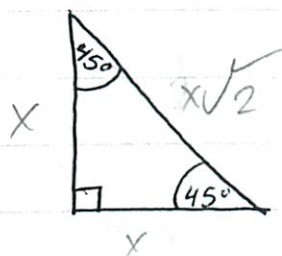
20/2 = 10

25/25

Name Michael
Date 3/15 Absent - 3/17

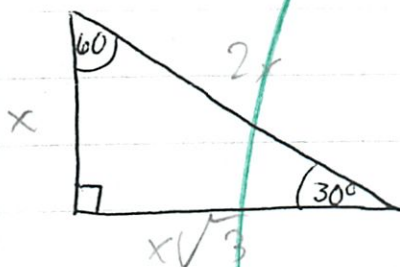
Special Right Triangle Pop-Quiz

1.



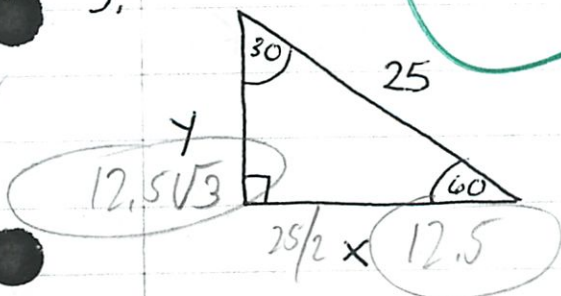
Label this triangle according to the special property of a 45, 45, 90 triangle.

2.



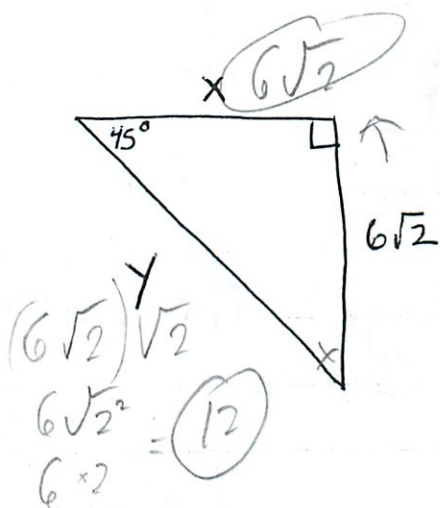
Label this triangle according to the special property of a 30, 60, 90 triangle

3.



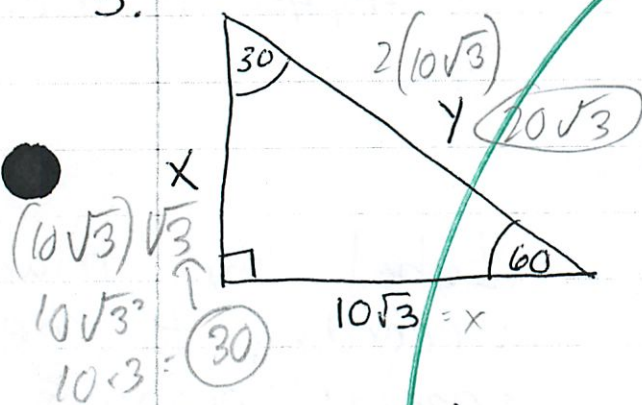
Find the value for x & y . Be sure to show your work.

4.



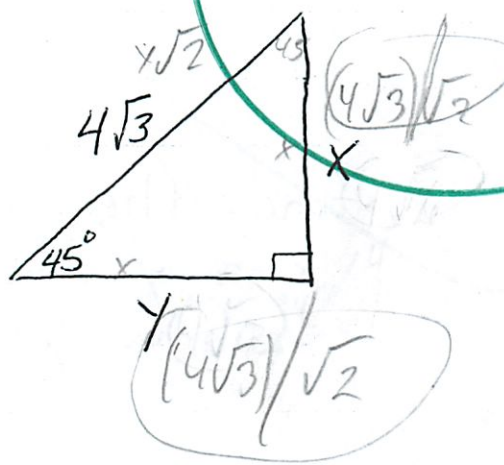
Find the value for x & y . Be sure to show all of your work

5.



Find the value for x & y . Be sure to show all of your work.

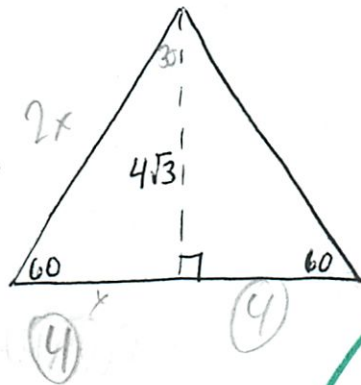
6.



Find the value for x & y . Be sure to show all of your work.

lowest

7.



Find the Area of this triangle. Be sure to show all of your work.

$$A = \frac{1}{2}bh$$

$$A = \frac{1}{2}(4+4)4\sqrt{3}$$

$$A = 4 \times 4\sqrt{3}$$

$$16\sqrt{3} \text{ units}^2$$

✓
? how to
(back
to total)

Name Michael Plasmier

Behl

IAG 2-H

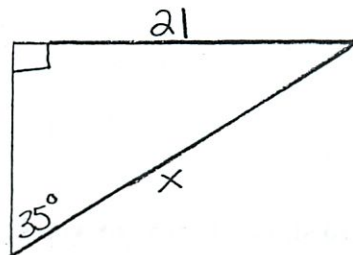
March 9th, 2006



ALMOST DONE BEE'S REVIEW

Directions: Find the missing side lengths. Be sure to show all of your work.

1.



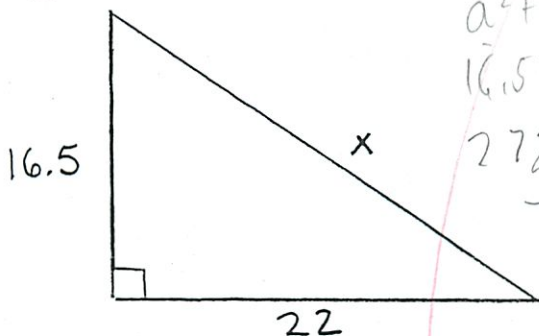
$$\sin 35 = \frac{21}{x}$$

$$\sin 35 x = 21$$

$$\begin{array}{r} 1.5736 x = 21 \\ \hline 1.5736 \quad .5736 \end{array}$$

$$x = 36.6124$$

2.



$$a^2 + b^2 = c^2$$

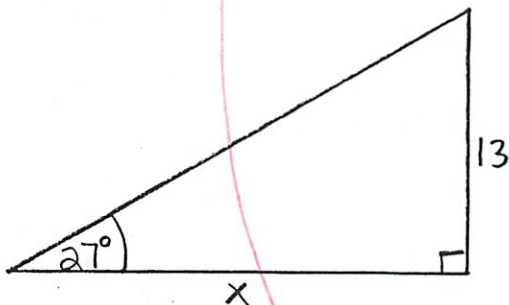
$$16.5^2 + 22^2 = x^2$$

$$272.25 + 484 = x^2$$

$$756.25 = x^2$$

$$x = 27.5$$

3.

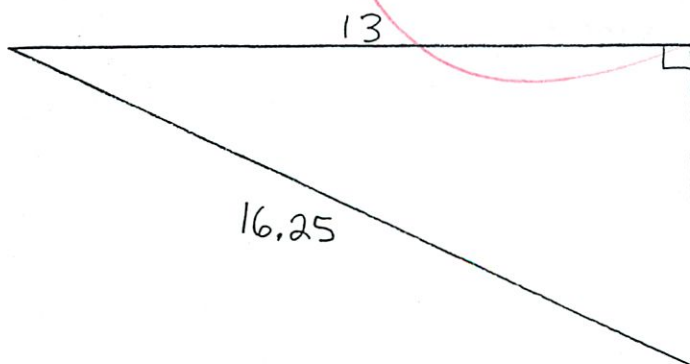


$$\tan(27) = \frac{13}{x}$$

$$\begin{array}{r} 1.5095 x = 13 \\ \hline 1.5095 \quad .5095 \end{array}$$

$$x = 25.5139$$

4.



$$a^2 + b^2 = c^2$$

$$13^2 + b^2 = 16.25^2$$

$$169 + b^2 = 264.0625$$

$$\begin{array}{r} 169 \quad 169 \\ \hline b^2 = 95.0625 \end{array}$$

$$x = 9.75$$

Directions: Simplify these square roots to their simplest form.

5. $\sqrt{361}$ (19)

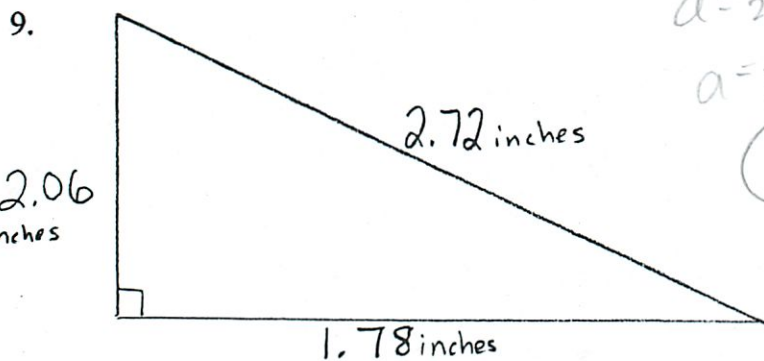
6. $\sqrt{252}$ $\sqrt{7} \times \sqrt{36}$ (6 $\sqrt{7}$)

7. $\sqrt{53+28}$ $\sqrt{81}$ (9)

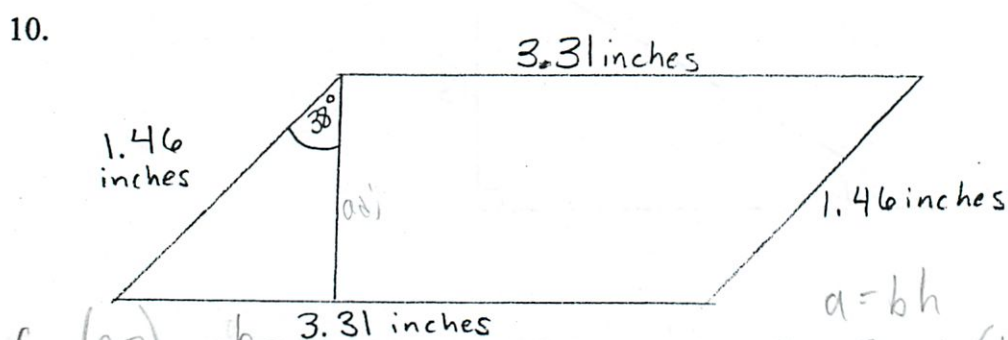
8. $\sqrt{\frac{16}{8}}$ $\frac{\sqrt{16}}{\sqrt{8}}$ $\frac{4}{\sqrt{4 \times 2}}$

Can go further
 $\frac{4}{\sqrt{2} \times \sqrt{2}} = \frac{4}{2} = 2$
 $\frac{2}{\sqrt{2} \times \sqrt{2}} = \frac{2}{2} = 1$
 $\frac{2\sqrt{2}}{2} = \sqrt{2}$
 Try Root program

Directions: Find the area of these polygons. Be sure to show all of your work.



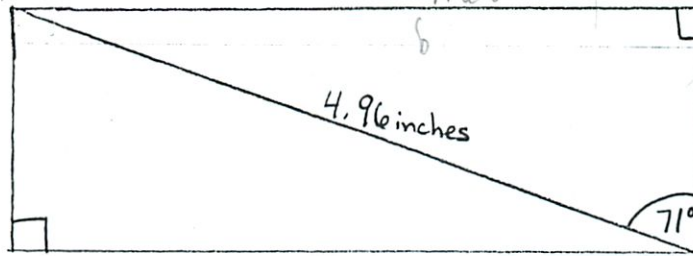
$a = \frac{1}{2}bh$
 $a = \frac{1}{2}(1.78\text{in})(2.06\text{in})$
 1.8334 in² e units



$\cos(38) = \frac{b}{1.46\text{in}}$
 $1.7880(1.46\text{in}) = b$
 1.75 in

$a = bh$
 $a = 3.31\text{in}(1.15\text{in})$
 3.808 in²

11.



$$\cos(71) = \frac{b}{4.96 \text{ in}}$$

$$.3256(4.96 \text{ in}) = b$$

$$b = 1.6148 \text{ in}$$

$$\sin(71) = \frac{a}{4.96 \text{ in}}$$

$$.9455(4.96 \text{ in}) = a$$

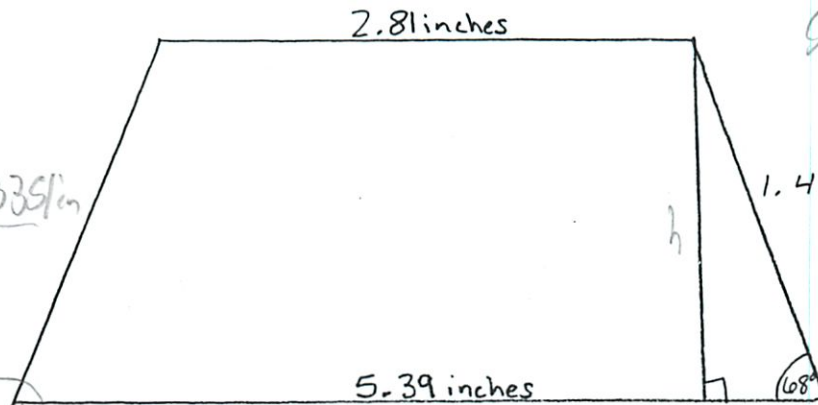
$$a = 4.6897 \text{ in}$$

$$a = bh$$

$$a = (4.6897 \text{ in})(1.6148 \text{ in})$$

$$a = 7.5731 \text{ in}^2$$

12.



$$A = \frac{(B_1 + B_2)h}{2}$$

$$A = \frac{(2.81 \text{ in} + 5.39 \text{ in})1.3351 \text{ in}}{2}$$

$$A = 10.9498/2$$

$$A = 5.4741 \text{ in}^2$$

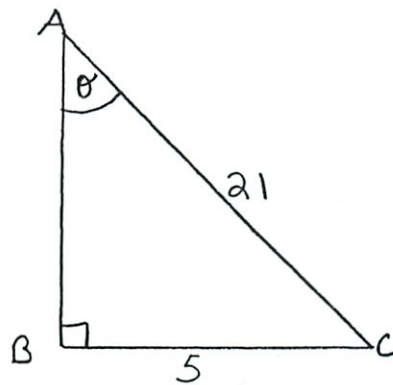
$$\sin(68) = \frac{h}{1.9271 \text{ in}}$$

$$.9271(1.9271 \text{ in}) = h$$

$$h = 1.3351 \text{ in}$$

Directions: Find the missing angle measurements. Be sure to show all of your work.

13.



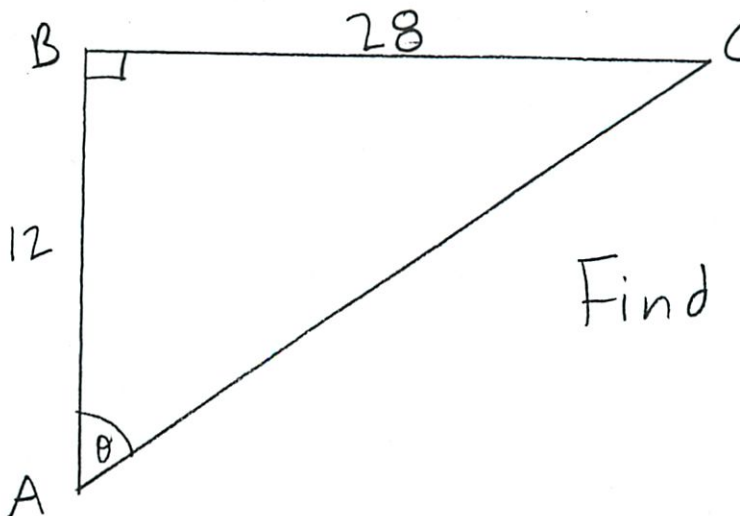
Find $\angle A$

$$\sin(\theta) = \frac{5}{21}$$

$$\sin^{-1}(5/21) =$$

$$13.7741^\circ$$

14.



Find $\angle A$

$$\tan(\theta) = \frac{28}{12}$$

$$\tan^{-1}(28/12) =$$

$$66.8014^\circ$$

Michael Mosher

Behl
TAG 2H9

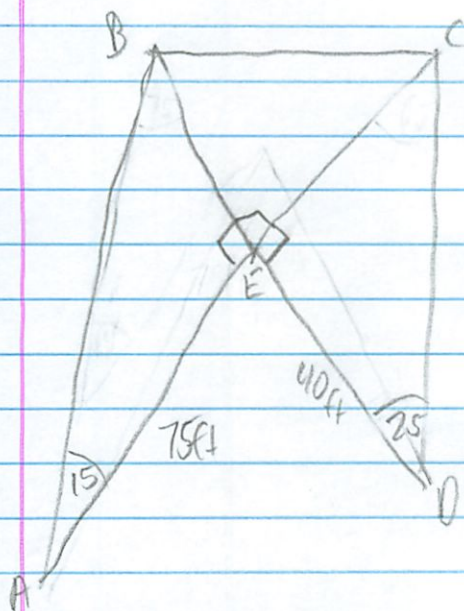
13 March 2008

Find BC Problem

$\frac{12}{12}$

3/13

Round to nearest tenth
Find length of side BC



$$\angle B = 180 - 90 - 15 = 75^\circ$$

$$\angle C = 180 - 90 - 25 = 65^\circ$$

$$\tan(15) = \frac{DE}{75}$$

$$1.2679(75) = DE$$

$$DE = 20.0061$$

$$\tan(25) = \frac{CE}{40}$$

$$1.4663(40) = CE$$

$$CE = 18.6523$$

$$a^2 + b^2 = c^2$$

$$20.0061^2 + 18.6523^2 = BC^2$$

$$403.8568 + 347.9085 = BC^2$$

$$751.7654 = BC^2$$

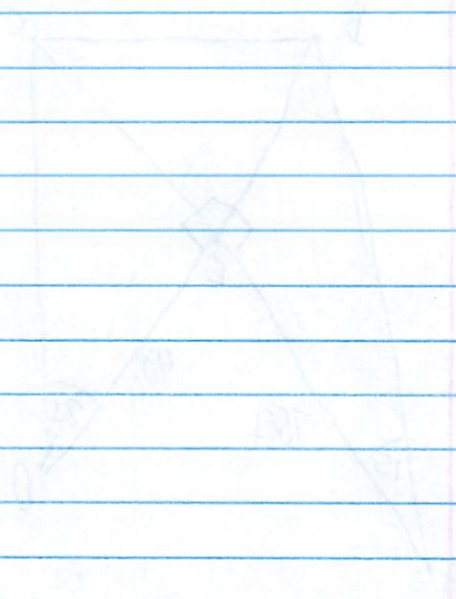
$$\sqrt{751.7654} = BC \rightarrow 27.41834 = BC \rightarrow \boxed{27.4 \text{ ft}}$$

$$\sqrt{(\tan(15)(75))^2 + (\tan(25)(40))^2}$$

$$\text{or } \sqrt{((\tan(15)(75))^2 + ((\tan(25)(40))^2)}$$

1/15

For BC Problem



$$\begin{aligned} \angle B &= 180^\circ - 90^\circ - 12^\circ = 78^\circ \\ \angle C &= 180^\circ - 90^\circ - 78^\circ = 12^\circ \end{aligned}$$

$$\begin{aligned} \frac{100}{\sin(12^\circ)} &= \frac{BE}{\sin(78^\circ)} \\ BE &= \frac{100 \sin(78^\circ)}{\sin(12^\circ)} \end{aligned}$$

$$\begin{aligned} \frac{100}{\sin(12^\circ)} &= \frac{CE}{\sin(78^\circ)} \\ CE &= \frac{100 \sin(78^\circ)}{\sin(12^\circ)} \end{aligned}$$

$$\frac{100 \sin(78^\circ)}{\sin(12^\circ)} + \frac{100 \sin(78^\circ)}{\sin(12^\circ)}$$

$$\frac{100 \sin(78^\circ)}{\sin(12^\circ)} + \frac{100 \sin(78^\circ)}{\sin(12^\circ)}$$

$$\begin{aligned} \frac{100 \sin(78^\circ)}{\sin(12^\circ)} &= \frac{100 \sin(78^\circ)}{\sin(12^\circ)} \\ \frac{100 \sin(78^\circ)}{\sin(12^\circ)} &= \frac{100 \sin(78^\circ)}{\sin(12^\circ)} \end{aligned}$$

$$\frac{100 \sin(78^\circ)}{\sin(12^\circ)} + \frac{100 \sin(78^\circ)}{\sin(12^\circ)}$$

Tessellations

Rules

3/7

1. A pattern page that repeats
2. Can go on and on - indefinitely
3. Can be symmetrical
4. Most times made of geometric figures
5. No gaps
6. No overlaps

Test 1/10/12
Rules

1. A game is played on a

board which is 10 squares

long and 10 squares

wide. The board is divided

into four

quadrants.

What shapes
tessellate

8/7

Triangles ✓

Squares ✓ - bit harder

Rhombus ✓

Trapezoids ✓

Hexagons ✓

Stretched Rhombus ✓ - bit harder

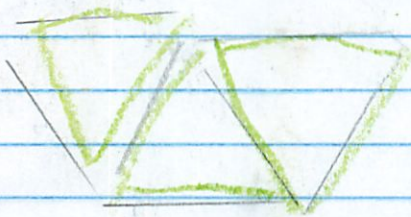
They all tessellate. They all go together next to each other and can make a pattern with each other. Really, any shape cut from a square or rectangle (without throwing out parts) can tessellate like on textbook p 236. Some go easier than others. It depends on the angles.

Squares + Stretched Rhombuses are a bit harder because the angles are different so they don't really tessellate with the other shapes.

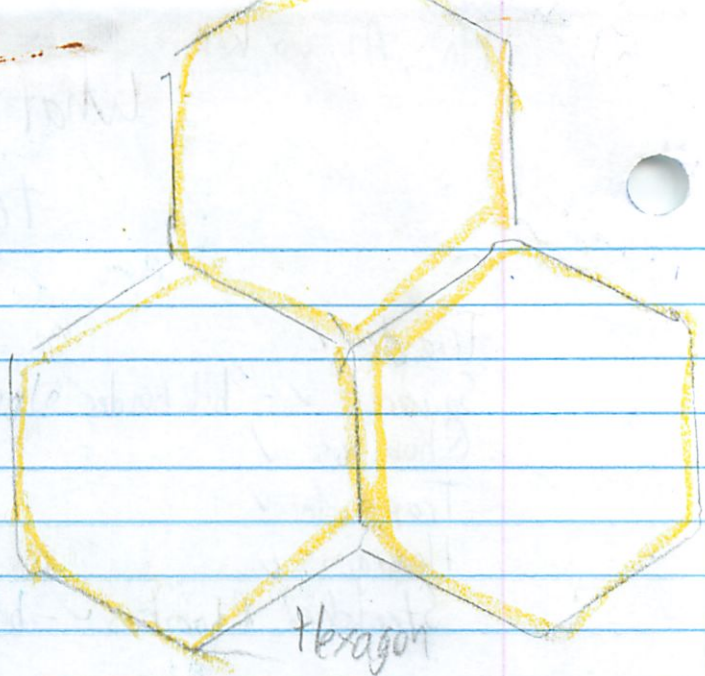
Triangles, Rhombuses, Trapezoids and Hexagons can all fit in a hexagon. The angles are multiples of 90° which fit together nicely. These tessellate the easiest with each other.

why? explain more about the angles.

4/5



Triangle



Hexagon



Square

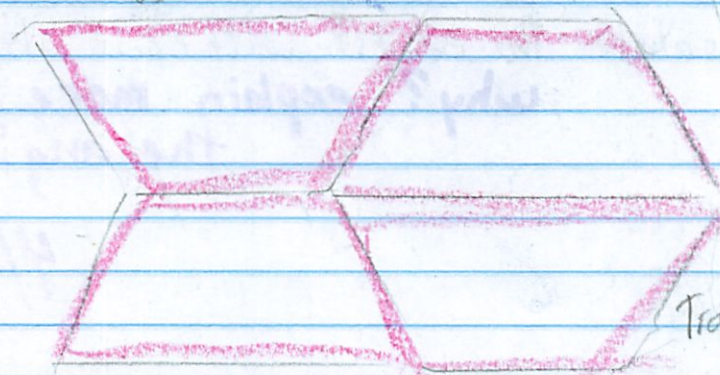


Naturally

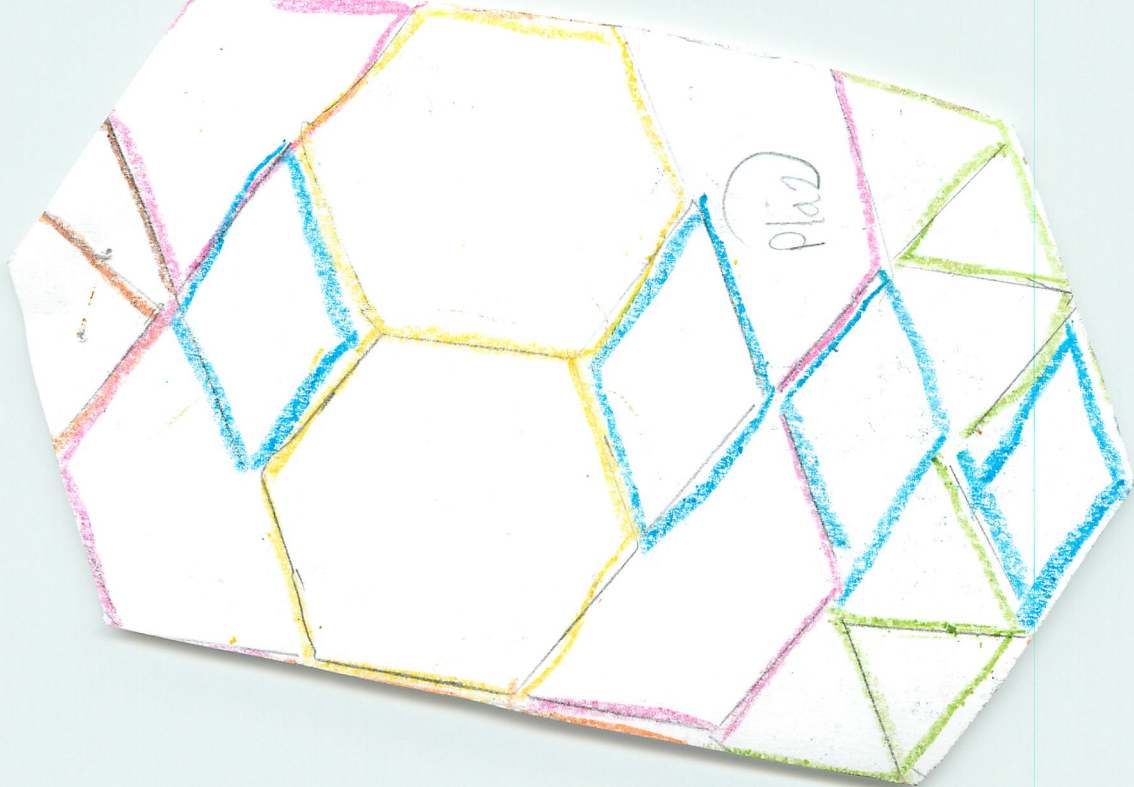
Stretched Rhombus



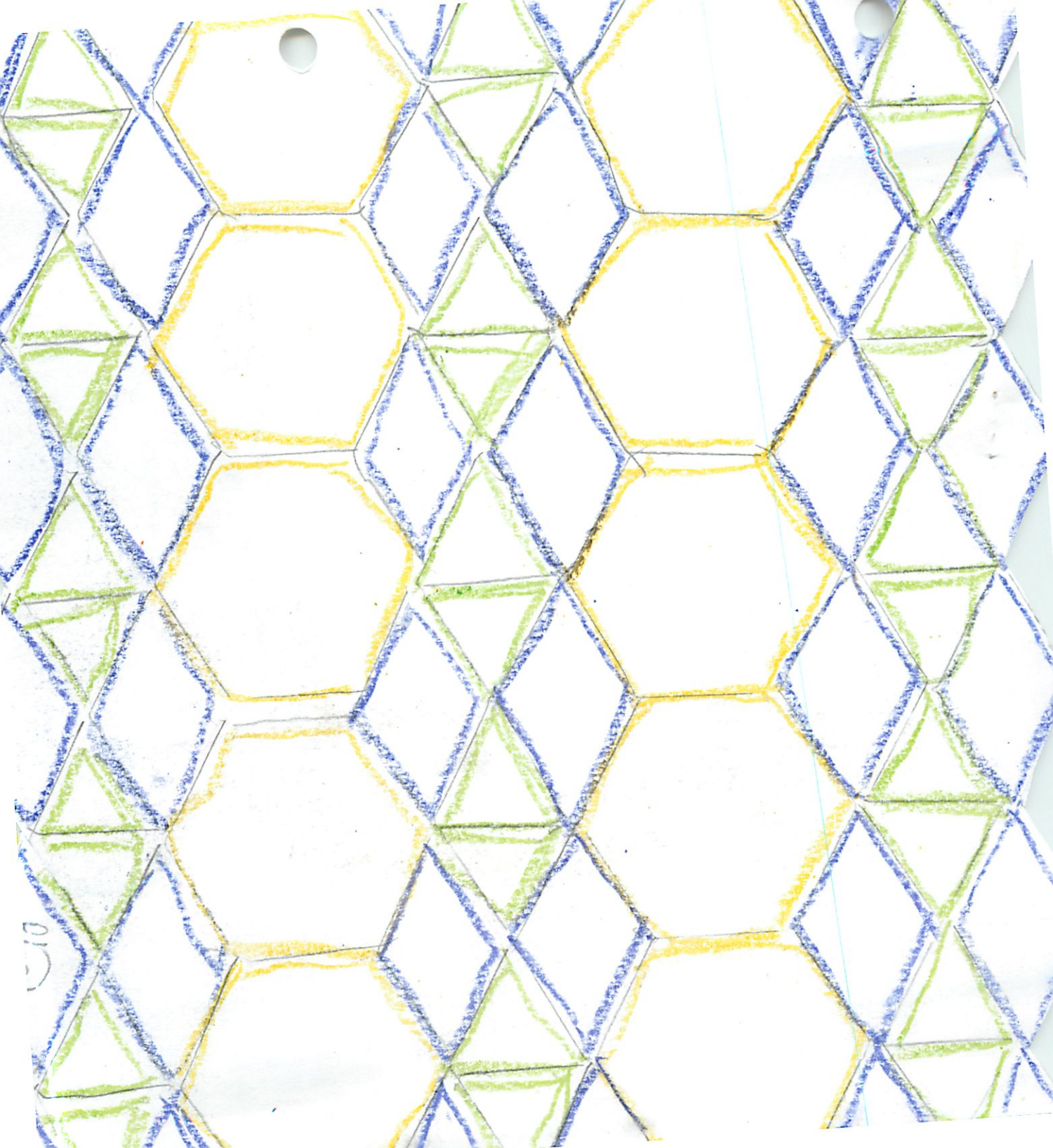
Rhombus



Trapezoid





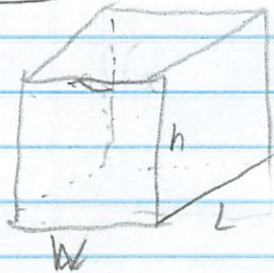


Michael Masmeier
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DA6244
13 March 2006

Surface Area + Volume

3/13

Cube



- 6 faces
- 8 edges

L - length
W - width
H - height

Surface Area - sum of the area of all the faces
- area of the solid if its outside were opened out and laid out flat

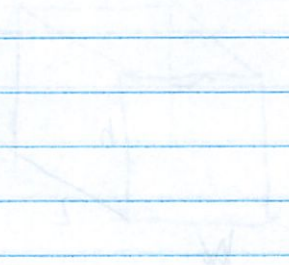
Volume - the measured amount of a space contained in a solid

Volume

Height

(over)

1 foot
8 feet



1 foot
8 feet
Height

Volume of a rectangular prism is found by multiplying the length, width, and height.

Volume = length $\times$ width $\times$ height

Michael Plasmior

Flat Boxes

$$2\text{cm} \times 5\text{cm} = 10\text{cm} \times 10\text{cm}$$

$$8\text{cm} \times 5\text{cm} = 40\text{cm} \times 40\text{cm}$$

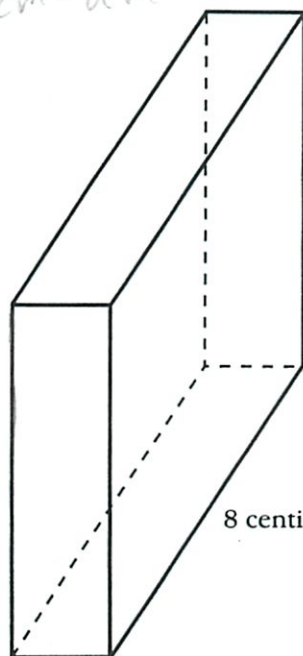
$$2\text{cm} \times 8\text{cm} = 16\text{cm} \times 16\text{cm}$$

$$3\text{cm} \times 6\text{cm} = 18\text{cm} \times 18\text{cm}$$

$$6\text{cm} \times 4\text{cm} = 24\text{cm} \times 24\text{cm}$$

$$3\text{cm} \times 4\text{cm} = 12\text{cm} \times 12\text{cm}$$

$$36\text{cm} \times 48\text{cm} \times 24\text{cm} = 108\text{cm}^2 \text{ surface area}$$



2 centimeters

$$= 132\text{cm}^2$$

Surface Area

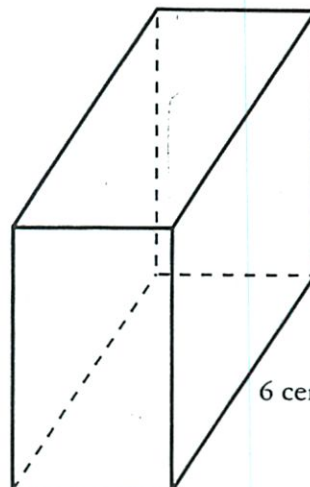
5 centimeters

$$2\text{cm} \times 8\text{cm} \times 5\text{cm} =$$

$$80\text{cm}^3$$

volume

8 centimeters



3 centimeters

4 centimeters

$$4\text{cm} \times 6\text{cm} \times 3\text{cm} =$$

$$72\text{cm}^3$$

volume

6 centimeters

Note: cubed for volume

Each of the diagrams above shows a rectangular solid (a box). *Note:* The diagrams are not drawn to scale, so you should use the measurements shown.

1. For each figure, make a net that will fold into the given solid. Your folded net should include both the top and the bottom.
2. Cut out and fold your nets to make each rectangular solid.
3. Find the total surface area for each rectangular solid.

Michael Plasmar
Bohl
IA62H9
14 March 2006

In + Outs of Boxes p 258

3/4

1.	In			Out
	Length	Width	Height	Surface Area
	8cm	2cm	5cm	132cm ²
	6cm	3cm	4cm	108cm ²
	4cm	2cm	3cm	52cm ²
	12cm	3cm	8cm	312cm ²
	30cm	10cm	10cm	1400cm ²

$$\text{Formula} = 2(lw) + 2(wh) + 2(lh) = SA$$

$$(lw) + (lw) + (wh) + (wh) + (lh) + (lh) = SA$$

2.	In			Out
	Length	Width	Height	Volume
	8cm	2cm	5cm	80cm ³
	6cm	3cm	4cm	72cm ³
	4cm	2cm	3cm	24cm ³
	12cm	3cm	8cm	288cm ³
	30cm	10cm	10cm	3000cm ³

$$\text{Formula} = V = lwh$$

Year	1990	1991	1992	1993
1990	100	100	100	100
1991	100	100	100	100
1992	100	100	100	100
1993	100	100	100	100

$$A^2 = (a_1^2 \quad a_1 a_2 \quad a_1 a_3) \begin{pmatrix} a_1 & a_2 & a_3 \\ a_2 & a_4 & a_5 \\ a_3 & a_5 & a_6 \end{pmatrix} = a_1 a_1 \begin{pmatrix} a_1 & a_2 & a_3 \\ a_2 & a_4 & a_5 \\ a_3 & a_5 & a_6 \end{pmatrix}$$

$$A_2 = \begin{pmatrix} 1 & 2 & 1 \\ 1 & 1 & 1 \\ 1 & 1 & 1 \end{pmatrix} = \begin{pmatrix} 1 & 2 & 1 \\ 0 & -1 & 0 \\ 0 & -1 & 0 \end{pmatrix} = \begin{pmatrix} 1 & 2 & 1 \\ 0 & -1 & 0 \\ 0 & 0 & 0 \end{pmatrix}$$

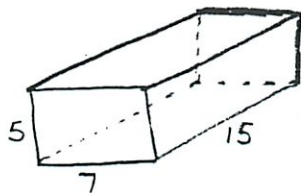
Blank lined paper with a vertical margin line on the left.

$$d\phi = V \cdot d\ln \phi$$

Surface Area and Volume Practice

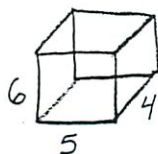
Directions: Find the surface area of the following shapes. Be sure to show all of your work!

1.



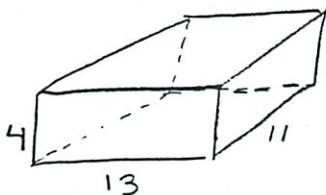
$$\begin{aligned} SA &= 2(5 \times 7) + 2(5 \times 15) + 2(15 \times 7) \\ &= 2(35) + 2(75) + 2(105) \\ &= 70 + 150 + 210 \\ &= 430 \text{ units}^2 \end{aligned}$$

2.



$$\begin{aligned} SA &= 2(6 \times 5) + 2(4 \times 6) + 2(4 \times 5) \\ &= 2(30) + 2(24) + 2(20) \\ &= 60 + 48 + 40 \\ &= 148 \text{ units}^2 \end{aligned}$$

3.

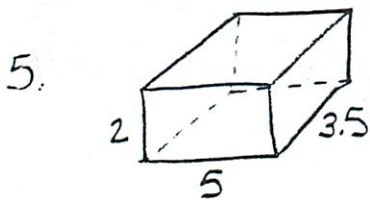


$$\begin{aligned} SA &= 2(4 \times 13) + 2(11 \times 4) + 2(11 \times 13) \\ &= 2(52) + 2(44) + 2(143) \\ &= 104 + 88 + 286 \\ &= 478 \text{ units}^2 \end{aligned}$$

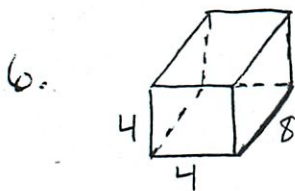
4. What is the formula you can use to find the surface area?

$$SA = 2(w \times h) + 2(lh) + 2(wl)$$

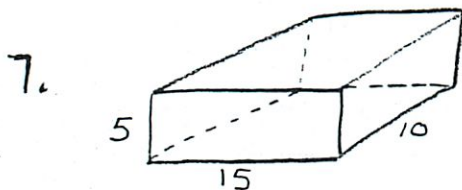
Directions: Find the volume of the following shapes
Be sure to show all of your work!



$$V = 2 \times 5 \times 3.5$$
$$35 \text{ units}^3$$



$$V = 4 \times 4 \times 8$$
$$128 \text{ units}^3$$



$$V = 5 \times 15 \times 10$$
$$750 \text{ units}^3$$

8. What is the formula you can use to find the volume of a shape?

$$V = lwh$$



Lesson 11.3

Volume of Prisms and Cylinders

On a typical day you will usually encounter many volume problems. For example, you may know that when you shop, it's a good idea to compare the volumes and the prices of different brands of a product to find the best bargain. And when you buy gas for your car or try to fit last night's leftovers into a freezer container, you must be familiar with volume.

Many occupations also require familiarity with volume. A chef must measure the correct volume of each ingredient in a cake to ensure a tasty success. To calculate stresses, an engineer must calculate volume to determine the weights of sections of a bridge. Chemists, biologists, physicists, and geologists must all make careful volume measurements in their research. Carpenters, plumbers, and painters also know and use volume relationships.

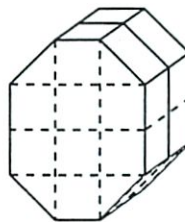
Volume is the measure of the amount of space contained in a solid.

You use cubic units to measure volume: cubic inches (in^3), cubic feet (ft^3), cubic yards (yd^3), cubic centimeters (cm^3), cubic meters (m^3), and so on. The volume of an object is the number of unit cubes that can be arranged to completely fill the space within the object.

Length: 1 unit



Volume: 1 cubic unit



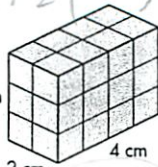
Volume: 20 cubic units

Investigation 11.3

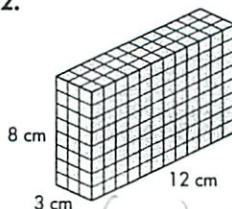


Let's begin our investigation of volume by looking at the volumes of some simple solids. It's easy to find the volume of a solid when it is a right rectangular prism with whole-number dimensions. Find the volume of each right rectangular prism below. (How many cubes measuring 1 cm on an edge will fit into each solid?)

1. $SA = 2(3 \times 2) + 2(4 \times 3) + 2(4 \times 2) \text{ cm}$
 $SA = 12 + 24 + 16$
 $SA = 52 \text{ cm}^2$
 $V = 3 \times 2 \times 4 \text{ cm} = 24 \text{ cm}^3$

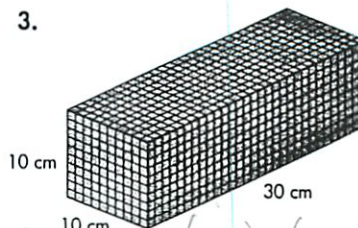


2.



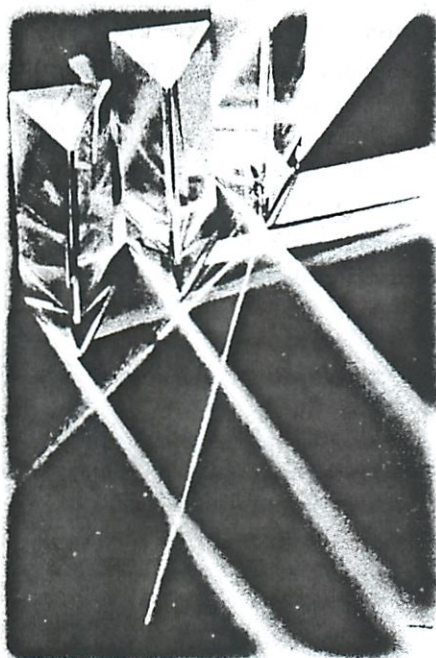
$SA = 2(8 \times 3) + 2(12 \times 8) + 2(12 \times 3)$
 $SA = 48 + 192 + 72 = 312 \text{ cm}^2$
 $V = 8 \times 3 \times 12 = 288 \text{ cm}^3$

3.



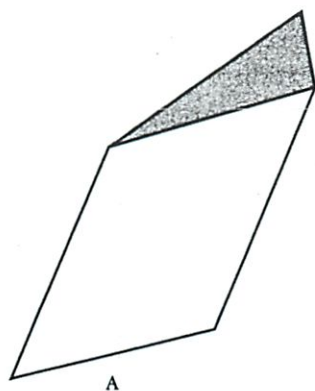
$SA = 2(10 \times 10) + 2(10 \times 30) + 2(30 \times 10)$
 $SA = 200 + 600 + 600 = 1400 \text{ cm}^2$
 $V = 10 \times 10 \times 30 = 3000 \text{ cm}^3$

The World of Prisms

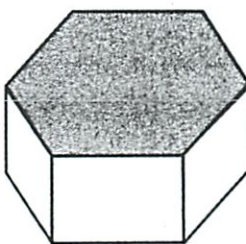


You may have used a glass object called a prism as a way to break up light into a rainbow-like pattern. A **prism** is a special type of solid geometric figure, and the object used for breaking up light is a special example of this type of solid.

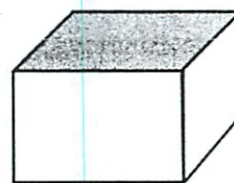
Geometrically, a prism is formed by moving a plane figure—often a polygon—through space for a fixed distance, keeping it parallel to its original position. The initial and final positions of the plane figure represent the **bases** of the prism. The perpendicular distance between the bases of a prism is called its **height**. Here are some examples of prisms. The shaded face is one of the bases in each case.



A



B



C

Prisms are classified by the shape of their base. Thus, example A is called a **triangular prism**; B is a **hexagonal prism**, and C is a **rectangular prism**.

Continued on next page

Do Bees Build It Best?

Reference

If the direction through which the base has moved is perpendicular to its original position, the resulting solid is called a **right prism**. An ordinary box is an example of a right rectangular prism. (Examples B and C are intended to show right prisms.) A prism that is not a right prism is called an **oblique prism**. (Example A is intended to represent an oblique prism.)

The faces of a prism other than its bases are called **lateral faces**. (The word "lateral" means *side*.) Because of the way a prism is defined, all of the lateral faces are parallelograms, no matter what the shape of the base. (If the prism is a right prism, the lateral faces are all rectangles.) The sum of the areas of the lateral faces is called the **lateral surface area** of the prism.

The line segments connecting a vertex of the lower base to the corresponding vertex of the upper base is called a **lateral edge**.

