WORKSHEET 1

1. The auditorium can only hold 450 people. There are already 45 people there working to put on a play for their family and friends. Each person working on the play wants to sell tickets. How many tickets can each person sell without exceeding the total number of people allowed in the building at one time?

    What is the unknown? _____ Call it "x"

    Total number of people allowed? _____

    Number of people in the play? _____

    Total People Allowed   People already there   Total tickets

    _____ - _____ = 45x

2. You are given 128 feet of chain link fence. It is your job to fence off a square shaped pen for several dogs. The pen must be 1024 square feet, in order for each dog to be comfortable. What length should each side of the pen be?

$$a = bh \longrightarrow$$

$$1024 \; sq \; ft = b^2$$

A square has 4 equal sides, so the base and height will be equal lengths.
$bh = b^2$

3. An artist painted a big picture on the side of a building. The picture is in the shape of a circle with an area of 113.04 square meters. What is the <u>diameter</u> of the painted circle?

$$area\ of\ a\ circle = \pi r^2$$

_____ = _____ x r²

4. There is a lot of snow on the roads. A truck driver needs to put chains around his tires, so his truck doesn't slip in the snow. The tires measure 30 inches from one side to the other. How long do the chains need to be to go around the tires?

5. There are 20 cubic feet of sand left over from a project. Mr. Wilson wants to build a sand box to hold the left-over sand. He built a rectangular box. The box is 5 feet long by 2 feet wide. How deep will the sand be once it is poured into the sandbox?

Name_____ Date _____

WORKSHEET 2

1. It took three hours for the airplane to travel 1800 miles. What was the airplane's rate of speed?

2. Teresa ran a 20-mile marathon. Her average speed was five miles per hour. Approximately how long did it take her to finish the race?

3. John and Pat drove from Seattle to Portland. They drove an average of 50 miles per hour and it took about three hours to get there. How far did they travel?

4. A golf ball travels 440 yards. It flew through the air at 100 miles per hour. How long did it take to land?

WORKSHEET 3

1. Trinity walked to town at a rate of four mph. She rode the bus back at 40 mph. The town is two miles away. How long did it take Trinity to travel to town and back?

2. A dog is resting against a pole to which he is attached with a 24-meter chain. He watches a cat approach within eight meters of the pole and promptly chases it. The dog runs at 12 meters per second and the cat runs at 10 meters per second. Which does the dog reach first, the cat or the end of the chain?


24 meters   8m   0
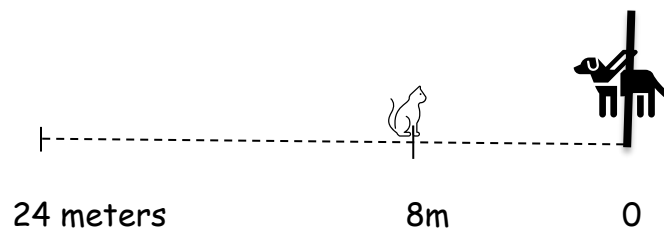
3. A pilot flew north against the wind, which was blowing at 40 mph, for 5 hours. Returning south at the same speed, with the wind pushing him 40 mph, he made the trip in 3 hours. What was the speed of the plane? (Hint: the distance is the same in both directions).

4. Two workers plan to mow 14 lawns. The older worker can mow 2 ½ lawns per hour. The younger worker can mow one lawn per hour. How long is this going to take the two workers to mow all 14 lawns.

Name_____ Date _____

WORKSHEET 4

1. Below are two congruent triangles. Draw little lines to show which sides are congruent. Fill in the blanks with the appropriate values and then solve for x, y, and m.
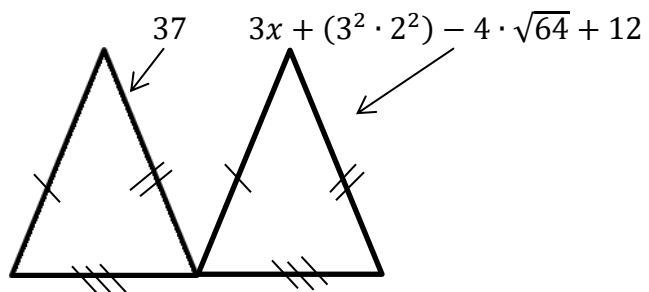
$\frac{1}{2}m - 2$ 35 $5x + 5$

21    $4y - 11$

28
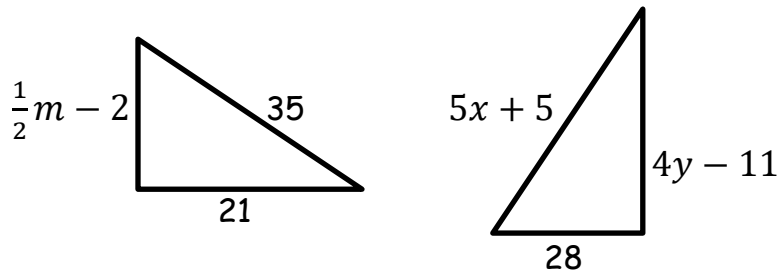
Side 1:   _____ ≅ _____

Side 2:   _____ ≅ _____

Side 3:   _____ ≅ _____

2. Look at the picture below. Solve for x.

37    $3x + (3^2 \cdot 2^2) - 4 \cdot \sqrt{64} + 12$

3. If $x = 4$, are the two triangles below congruent?

110
36
54

$5x + (2^2 \cdot 8) + 2$
$25x + 5$
$9x$
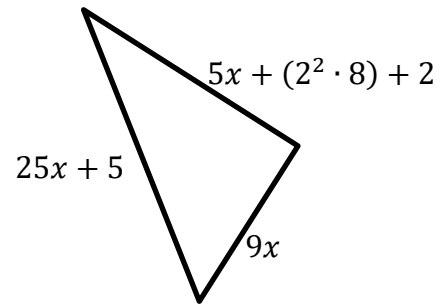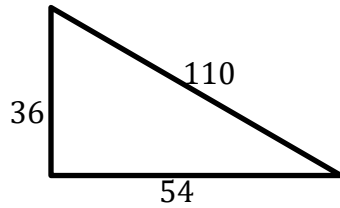
4. Every triangle has three angles. When you add all three angles together, it will always equal 180 degrees. Solve for x with the information given below.
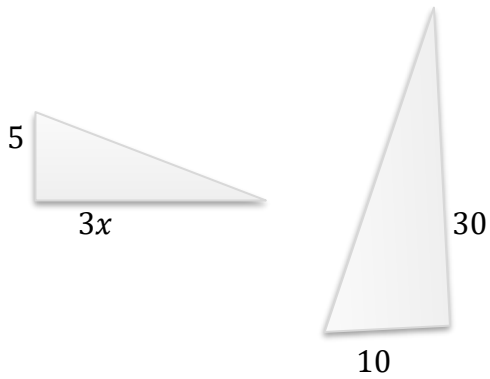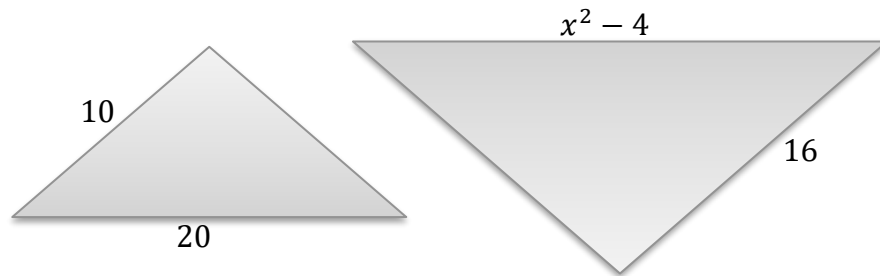
$5x$ $6x + 3$

$89°$
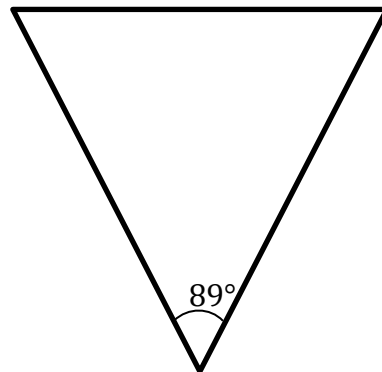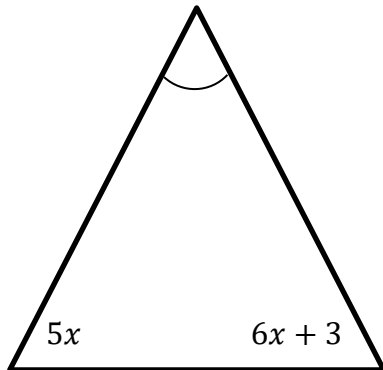
Name_____ Date _____
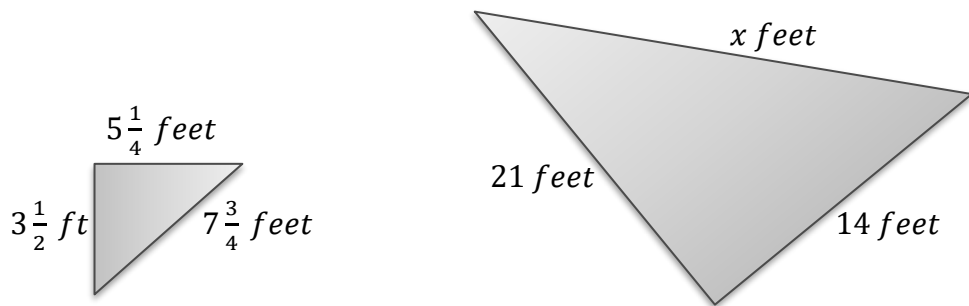
WORKSHEET 5

Solve for "x" in the following sets of similar Triangles.

1.

5

$3x$

30

10

_____

2.

$x^2 - 4$

10

20

16

_____

3.

$x\ feet$

$5\frac{1}{4}\ feet$

$21\ feet$

$3\frac{1}{2}\ ft$ $7\frac{3}{4}\ feet$

$14\ feet$

_____

4. Solve for x in these two similar, isosceles Triangles.

$\frac{7}{9}$ $\frac{18}{7}$

x 6

_____
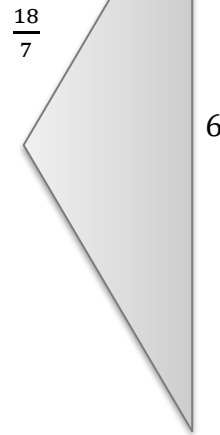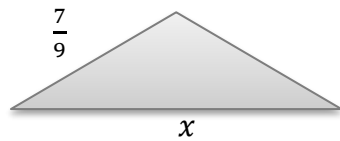
5. A builder wants to know the square footage of the shaded triangular area of the building below. His ladder isn't tall enough to measure the height of the triangle, so he will have to use math instead. He knows that the pitch of the roof is 5:12. Use similar triangles to find the area of the shaded area below. (HINT: Slice the gray triangle in half, so it is similar to the pitch).

5"
12"

24'

_____
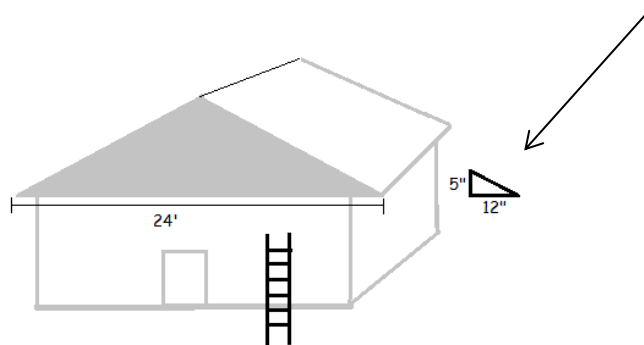
Name _____ Date _____

CHAPTER 1 TEST

1. Judy needs to receive an average score of 94 in order to earn a scholarship. On the first test she received a score of 95. On the second test, she earned a score of 93. The third test was her worst score, it was a 92. What score must she get on her fourth test in order to earn the scholarship?

2. Daryl wants to save up $2000 to get his truck painted. He already has $750 saved up and he can earn $40.00 per hour at his job. How many hours does he need to work to earn enough money for the new paint job?

3. A horse is tethered to a pole in the center of a pen. The horse walks in a circle, stretching the rope as far as possible as he walks around the pole. Each time he circles the pole he travels 113.04 feet. How long is the rope?

Horse

Rope
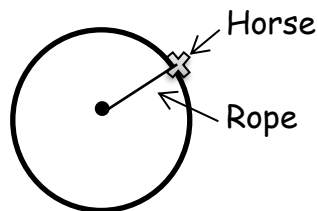
4. A homemade rocket shot straight up into the air. The radar detector showed that it traveled at 110 mph. The stopwatch showed that it traveled upwards for one minute before it started to fall. Approximately how far did the rocket travel? _____

5. A train is traveling east at 100 mph. Another train is heading straight towards it at 80 mph, 55 miles away. The trains will hit each other at the halfway point, if the tracks are not switched in time. The engineer can't switch the tracks for 15 minutes. Will the trains hit each other before the engineer can flip the switch? _____

6. Are the two isosceles triangles below congruent? _____

7x + 7

50

8x + 2

50
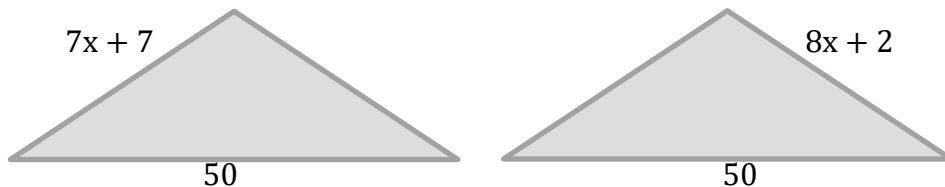
7. A builder needs to replace the blue boards on the house below. He charges $10 per foot to replace the boards. How much will the builder charge? In other words, how long are the two blue boards below? Multiply that by $10.

x

Blue Boards

12 ft

20 feet   15 feet
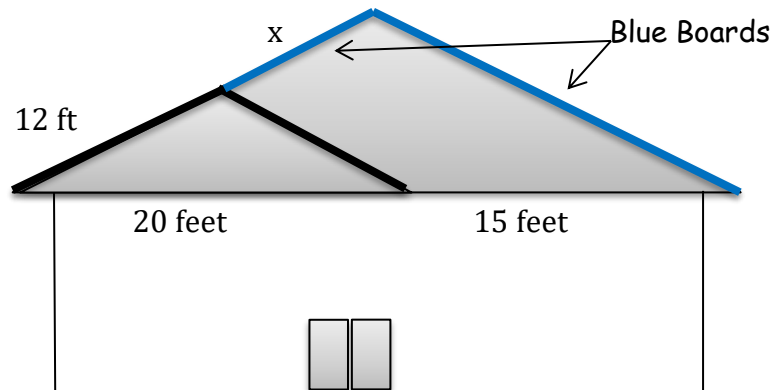
8. A factory can produce two guitars every five hours during the day shift and four guitars in five hours during the night shift. If each shift works 12 hours per day, how many days will it take to fill an order of 72 guitars?

9. Jo-Jo is going to drive from Tacoma to Federal Way, drop off an envelope and then drive back to Tacoma. This trip will take 40 minutes to complete. If he continues at the same rate of speed, how long will it take him to drive to Kent?

Gig Harbor

40 miles

Federal Way

x

30 miles

20 miles

Olympia

Tacoma

Kent
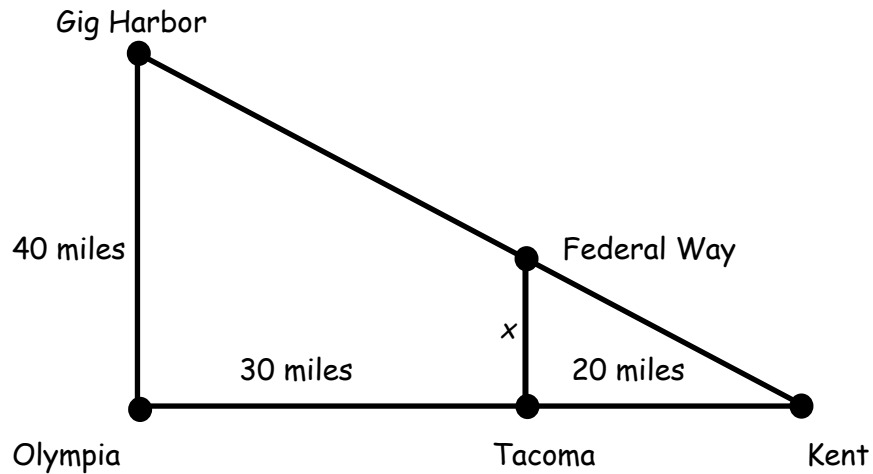
WORKSHEET 6

1. In a box of 100 animal cookies, there are four different animal shapes. There are 25 bears, 20 giraffes, 30 lions, and 25 camels. What is the probability of randomly selecting a lion shaped cookie out of the box?

2. I have written down some names and put them in a hat. Six of them are girl names and seven of them are boy names. If I draw a name out of the hat, what is the probability of it being a boy's name?

3. There are a dozen light bulbs in a box. Three of them are burnt out. What is the probability of selecting two light bulbs that both work?

4. I roll two dice at the same time. What is the probability of them both landing on five?

5. Two cards are selected from an ordinary deck of cards. What is the probability of them both being black or both being red?

WORKSHEET 7

Solve the Inequalities below.

1. $x - 8 > 5$

2. $-10x < 20$

3. $-2x > -12$

4. $5x - 4 < 2x + 8$

5. $\frac{3x-1}{2} < 10$

6. $4x - 3 < 2x + 7$

7. $\frac{3x+5}{2} < 7$

WORKSHEET 8

1. A container holds 18 liters of a solution that is 7% acid. It is poured into 12 liters of a 20% acid and water solution. What is the percentage of acid in the new solution?

2. You have a container with 32 ounces of a solution of 23% alcohol and water. Your assistant accidentally poured 8 ounces of an alcohol and water solution, and now your container is down to 20% alcohol. What was the percentage of alcohol in your assistant's glass?

3. How much of a 5% iodine and water solution should be added to 4 cups of 2% iodine and water to create a solution that is 3% iodine and water?

4. How much pure water should be added to 180 ml solution of bleach and water that is 23% bleach to dilute it down to a solution that is 10% bleach and water?

5. A gas can contains twelve cups of an oil and gasoline solution. It is currently 60% oil, but it needs to be down to 45%. How much pure gas should be added to the solution to get it to 45% oil?

6. If you mix 135 cm^3 of a solution that is 17% alcohol and water with 80 cm^3 of a 53% alcohol and water solution, what will the new percentage of alcohol be?

WORSHEET 9

1. In this part of the country, the water in a car's radiator should be 20% anti-freeze, so it doesn't freeze during the winter months. The radiator holds five gallons of water and anti-freeze solution. How much pure water and pure anti-freeze should be used to obtain the proper solution in the car?

2. A nurse has two containers of Isopropyl Rubbing Alcohol. One container has 70% alcohol and the other one has 91%. She is instructed to use just enough of each solution to obtain 50 milliliters of 80% Isopropyl Rubbing Alcohol. How much of each container should she use? Round your answers to the nearest one-hundredth.

3. A nurse is preparing an IV bag of water and sugar. She has a large bottle that is 15% sugar, but the IV bag needs to be one liter of 9% sugar water. How much of the bottle should she add to what amount of water?

4. A one-gallon tub of Epsom Salt and water is 6% Epsom salt. How much pure water should be added to make a solution that is 4% Epsom salt?

5. A solution of acid and water is 16% acid. How many cups of this solution should be mixed with pure water to make 21 cups of a solution that is 10% acid? Do not round your answer.

6. A masonry needs to clean a concrete wall. A solution of bleach and water works very well. He will need five gallons of a bleach water solution that is 20% bleach. He has a container of 12% bleach water. How much of that solution should he mix with pure bleach to get the proper percentage?

7. Make up your own solution problem with two variables. Solve it and then double check your work by replacing x and y with your answers. If both sides of the equal sign are equal, then your answer is correct.

WORKSHEET 10

1. We have two types of Christmas cards. One set has a glitter border; they sell for 50 cents each. The other set is plain and only cost 30 cents each. How many of each should be placed in assortment boxes of 50 cards each to sell for $18 per box?

2. A dairy sells pure cream for 75 cents per cup and skim milk for 25 cents per cup. How many cups of each should be mixed to make coffee creamer that will sell for $8 per gallon?

3. A store owner is selling fresh cut fruit in $4\frac{1}{2}$ pound containers. The berries cost $4.75 per pound and the melon costs $4.20 per pound. The store owner plans to add $5 per container for the labor, materials, and profit. If he wants to sell the containers of fruit for $25 each. How many pounds of each fruit should he put in each mixture?

Name _____ Date _____

CHAPTER 2 TEST

1. A number is randomly selected from the set of numbers below.

$$5, 11, 23, 42$$

   What is the probability of that number being greater than 25?

2. A drawer holds 12 socks. There are six blue socks and six black socks. What is the probability of selecting two socks of the same color?

Solve the inequalities.

3. $4x - 6 < 7x + 12$

4. $-6 < -2x + 4$

5. $\frac{4x+6}{2} < 4$

6. A solution of acid and water is 16% acid. How many cups of this solution should be mixed with pure water to make 32 cups of a solution that is 10% acid?

7. A solution of water and lemon flavoring will be mixed to make eight cups of lemonade. We don't want the drink to be too sweet or too sour, so it must be 15% lemon flavoring. How much water should we use?

8.   A solution of salt and water is 30% salt. How many cm^3 of this solution should be mixed with pure water to make 18 cm^3 of a solution that is 10% salt?

9. The owner of a pizza store wants to write down the exact recipe for a pepperoni and olive pizza, so he is sure to keep the cost and weight the same for every pizza. He already knows how much a cheese pizza costs and weighs and would like to add eight ounces of toppings for only $1.80 more per pizza. The pepperoni costs 90 cents per ounce and the olives cost 10 cents per ounce. How many ounces of each ingredient should the store owner use?

10. Debbie wants to make snack mix and then fill a 4-cup bag that cost $5.50 per bag. The cereal costs $0.50 per cup and the nuts cost $3.00 per cup. The bag, butter, and seasoning costs 1.00 per 4 cup bag. How much cereal and nuts should be added to each bag to keep the cost at $5.50?

Name _____ Date _____

Add the linear equations together to find the simultaneous solution set of each or if you prefer, use the substitution method.

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

2. $3x + 2y = -2$

   $5x - y = 14$

3. $\frac{1}{2}x + y = \frac{1}{2}$
   $9x - 6y = 1$

4. $5x - 4y = 1$
   $10x + 6y = 9$

WORKSHEET 12

Below are two linear equations. Find the simultaneous solution twice, by using both the substitution method and by adding the equations together. Once you have solved the simultaneous solution, find two other points for each line using the tables below. Then, plot those two lines onto the graph to prove that you have the correct answer.

$$5x - 4y = 1$$
$$10x + 6y = 9$$

x	y
1	
$\frac{3}{5}$	
2	

x	y
1	
$\frac{3}{5}$	
2	
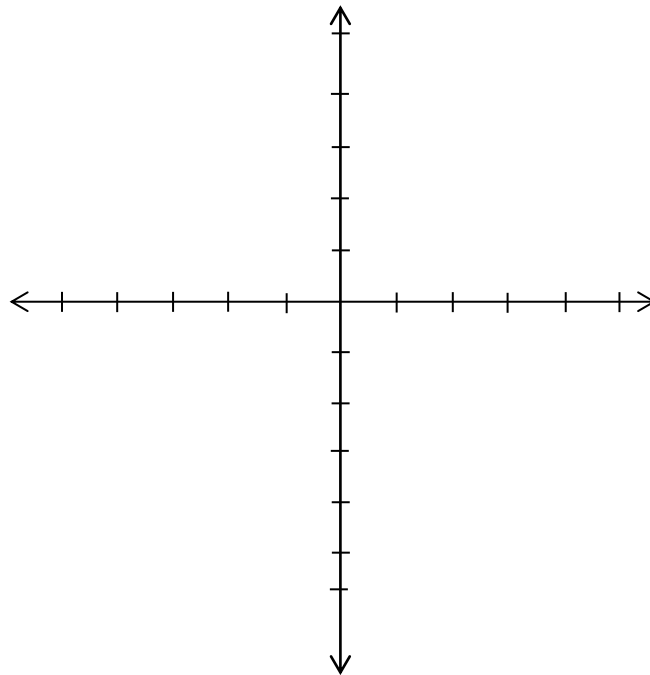
WORKSHEET 13

1. The sum of two numbers is 43 and their difference is 9. Find the numbers.

2. Alvin is going to install some decorative tiles around a swimming pool. He will need to arrange 250 tiles using an assortment of plain white tiles and some expensive hand painted ones. The plain white tiles cost 50 cents each and the hand painted ones cost $3 each. His labor costs $250 and he is charging $800 for the whole job. How many of each tile should he use to stay within the budget?

3. A plane is flying against the wind from Town A to Town B. The two towns are 500 miles apart. It took the pilot 4 hours to get to Town B and 2 hours to get back to Town A. What were the speeds of the wind and the plane?
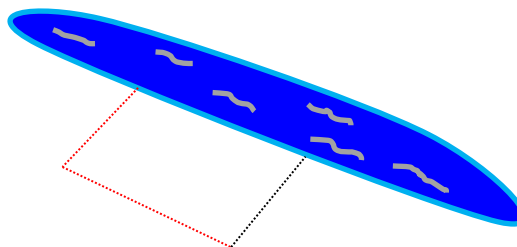
Name _____ Date _____

1. The area of a garden is 48 square meters. If the base is two meters longer than the height, how much fencing will be required to enclose it?

2. I need to order a box that is four inches deep with a volume of 320 in³. The length needs to be two inches longer than the width. The factory would like to cut four inch squares out of the corners of a flat piece of cardboard and then flip up the sides to create the box. What should be the size of the flat piece of cardboard?

3. You need to fence off a rectangular shape next to a river. The area of the enclosure needs to be 96 square meters and the length should be four meters longer than the width. What should be the dimensions of the three fence sections?
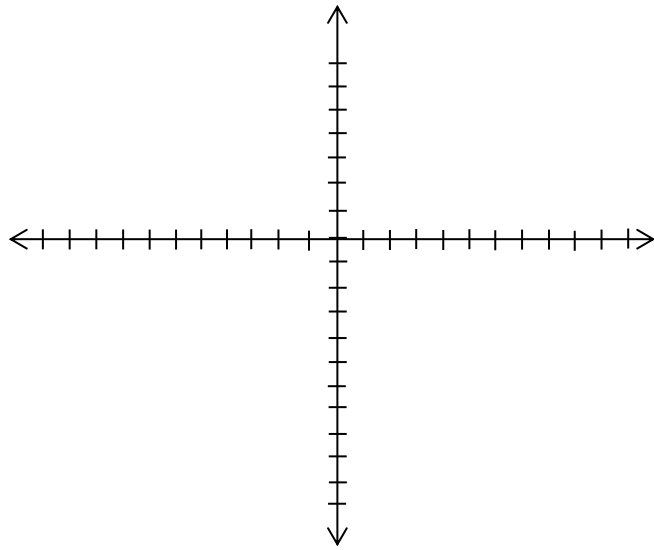
Name _____ Date _____

WORKSHEET 15

1. A man is going to row a boat up a stream for 4 miles. The rate of the current is 2 mph. He needs to row up the stream and then back down in 2 hours and 40 minutes. How fast should he row?

2. In the last problem, you ended up with an equation that was in the standard for of a quadratic equation. Write that equation here:

   _____

   Use that equation to fill in the table below and then plot those points onto the graph on the next page.

$f(-2)$	$f(-1)$	$f(0)$	$f(1)$	$f(2)$	$f(3)$	$f(4)$	$f(5)$

Worksheet 15 page 2

WORKSHEET 16

1. Pilot Olivero agrees to fly a group of people to Lake Michigan for $3,136.00. There are still a few empty seats, so the group invited seven more people. Now each person will pay $8.00 less per ticket. How much will each ticket cost now?

2. A construction crew has been asked to build a fence for $187.50 using power tools. Then, they agreed to build another fence for the same price, but this time, they couldn't use power tools. It took one hour longer to build, and they made $50 less per hour. How long did it take to build the fence with and without power tools?

3. A company is running a sale for a certain amount of time. Their goal is to sell $75,000 worth of merchandise during the sale. Unfortunately, there was a storm, and the store had to close for the first five days of the sale. Now they have to make an average of $500 more per day to reach their goal. How long did they plan to run the sale before the storm?

Name _____ Date _____

FINAL TEST

1. A race car driver is trying to beat his opponent's record. His opponent drove 200 miles in 1 hour and 10 minutes. If the race car driver travels at an average speed of 175 miles per hour, will he beat his opponent's record?

2. Esther jogged at 4 mile per hour for 2 hours and 45 minutes. How far did she get?

3. Teresa and Jessica are sewing some aprons. Teresa has been sewing for many years and she can complete 3 aprons in just 1 hour. Jessica is new at this job and can only sew 1 apron in 2 hours. If the two of them work together for 8 hours, how many aprons will they make?

4. Steve, Mike, and Eric worked for 6 hours and 40 minutes cutting grass. After the first hour, Steve had mowed ¾ of the first lawn. Mike had mowed ½ of the second lawn and Eric had mowed ¼ of the third lawn. If they keep up this same pace for 6 hours and 40 minutes, how many lawns will they mow?

5. The two triangles below are congruent. Solve for x.

$3x + 14$

$18 + 2x$
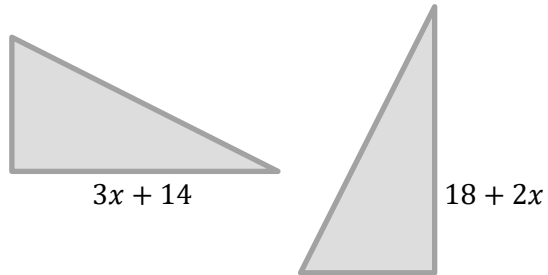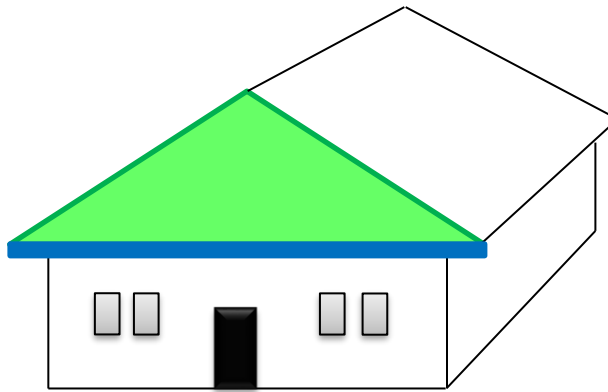
6. What is the area of the shaded triangle below?

15 ft

24 feet
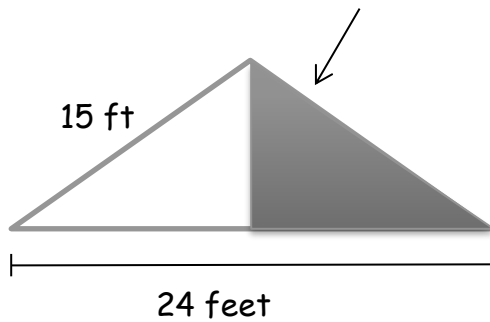
7. A builder needs to re paint the green triangular portion of this house a different color. He is told that the roof has a pitch of 6:12 and he knows that the blue board is 32 feet long. Each can of paint will cover 140 square feet. How many cans of paint will he need?

8. What is the probability of rolling an even number on a regular 6-sided die?

9. In a carton of a dozen eggs, 3 of the eggs are broken. You randomly select 2 eggs to cook. What is the probability of selecting 2 broken eggs?

10. A bowl contains 5 girl names and 7 boy names. What is the probability of randomly selecting two boy names or two girl names?

Solve the inequalities below.

11. $3(x + 2) < 5(x - 4)$

12. $\frac{x}{5} - \frac{x}{2} < 3$

13. $-16x < -32$

14. $-\frac{2}{5}y < 20$

15. $5y - 7 > 4 - y$

16. You are told to create 50 cm^3 of a solution that is 8% bleach and water. How much pure bleach should you add to what amount of pure water?

17. You are instructed to fill a fish tank with 400 gallons of saltwater that is 25% salt. You are given two containers of different saltwater. One is 40% salt the other one is 20% salt. How much of each solution should you pour into the tank?

18. A 100 cm^3 solution of acid and water is 26% acid. How many cubic centimeters of pure water should be added to make a solution that is 13% acid?

19. A candy store wants to sell 4-pound bags of candied popcorn and peanuts at a price of $9.60 cents per pound. The candied popcorn costs 50 cents per ounce and the peanuts cost 65 cents per ounce. How many ounces of each ingredient should be mixed together to create such a mixture?
     (Remember to keep your units the same).

20. A street vendor is selling balloons. He decides to create some bouquets of 15 balloons and sell them for $20 each. The regular latex balloons full of helium cost $1 each. The shiny Mylar balloons full of helium cost $1.50 each and the string, ribbons, and fancy weight cost $2 for each bouquet. How many of each balloon should he use?

21. Solve for the simultaneous solution by using the addition method.

$$x + 2y = -1$$
$$3x + 5y = -4$$

22. Solve for the simultaneous solution by using the substitution method.

$$x + 4y = 13$$
$$4x - y = 18$$

23. A plane flew from point A to point B against the wind for 4 hours. The plane returned back to point A in 3 hours. The distance between point A and point B is 1200 miles. What were the rate of the wind and the speed of the plane?

24. A train is traveling east at 80 mph. Another train is traveling west at 100 mph, just 90 miles away. How long will it take for the trains to meet and how far will each train have traveled?

25. A woman is trying to swim 2 miles upstream against the current and then back downstream in 30 minutes. If the rate of the current is 3 miles per hour, how fast should she swim?

26. In the last problem, you created a quadratic. Write it below.

_____

Fill in the table below and then plot those points onto the graph.

$f(-2)$	$f(0)$	$f(2)$	$f(4)$	$f(5)$	$f(6)$	$f(8)$	$f(10)$