Unit Rates

Unit Rate:	

Find the unit rate for each of the following:

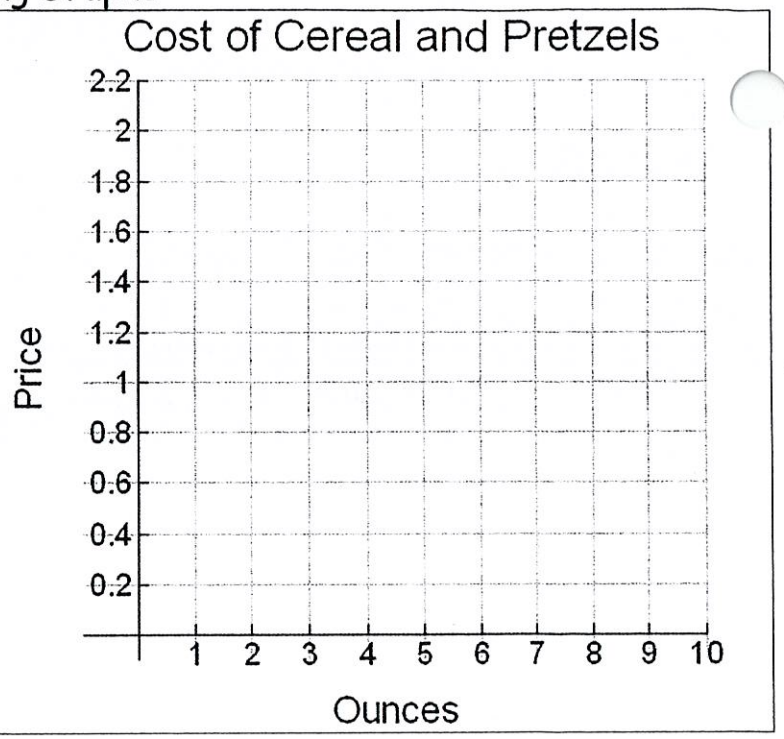
Example 1: 7 oz of crackers for $1.19	Example 2: 1 pizza can feed 4 people. How much pizza would be needed to feed 18 people?

Example 3 Unit Cost	Soap: Which is the best buy? Regular (12 fluid ounces): $ 1.34 Family (28 fluid ounces): $ 3.25 Economy (40 fluid ounces): $ 4.08
Example 4 Unit Rate	If John can paint 1/8 of a wall in 11 minutes, how long will it take him to paint a room with 3 walls?
Example 5 Unit Rate	A 3-pound package of ground beef is $7.80. A $\frac{1}{2}$-pound package is $1.28. What is the difference in the cost per pound between the larger and smaller packages of beef?

Using Graphs

Comparing Costs

	Cereal	Sourdough Pretzels
1 ounce		
3 oz.		
8 oz.		$1.36
10 oz.	$2.20	
12 oz.		
14 oz.		



1. Using the information given in the table below, construct a graph of the prices.

2. How can you use the information in the rate table to fill in the missing information? Does it match the lines that you have created on your graph?

3. Which product is most expensive per ounce? The least expensive per ounce? How is this shown in the graph? The rate table?

4. Using your price graph, about how much would you pay for 6 ounces of sourdough pretzels?

5. What does the point (1, .22) mean on the cereal line?

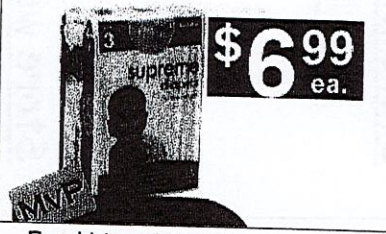
6. What does the point (1, .17) on the pretzel line mean?

Best Buy

Find the Unit Rate for each item:

Kroger: 9oz. bags of Fritos/Cheetos

Food Lion: 35 Baby Diapers



Kroger: Granola Bars- 6 per box

Food Lion: 24oz. bottles of ketchup

Hunt's Ketchup

You have lots of options when grocery shopping!! Find the unit rate to determine which store has the least expensive item - the BEST BUY!!

PEPSI PRODUCTS

Harris Teeter Neighborhood Food & Pharmacy

OR

FOOD LION

LAUNDRY DETERGENT

Kroger

$3.49 With Card

Arm & Hammer Laundry Detergent 46 ounces

OR

FOOD LION

Wisk Laundry Detergent 50 Ounce, 26-32 Loads Select Varieties

Orange Juice

Kroger

64 ounces

Minute Maid Orange Juice

$2.49 With Card

OR

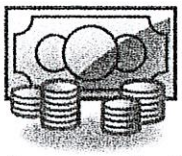
FOOD LION

Sunny Delight 128 Ounce

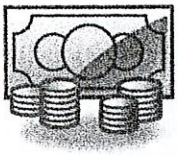
OR

Harris Teeter Neighborhood Food & Pharmacy

At Harris Teeter, you can be a VIC member, where you earn additional discounts. How much do you save per ounce of Simply Orange if you are VIC member?



Best Buy



Find the Unit Rate for each item. Be sure to label units in both the denominator and the numerator.

Kroger: 9oz. bags of Fritos/Cheetos	Food Lion: 35 Baby Diapers
Kroger: Cereal Bars- 6 per box	Food Lion: 24oz. bottles of ketchup

You have lots of options when grocery shopping!! Find the unit rate to determine which store has the least expensive item - the BEST BUY!!

PEPSI PRODUCTS	Store with the Best Buy
Harris Teeter: Food Lion:	

LAUNDRY DETERGENT	Store with the Best Buy
Kroger: Food Lion:	

Orange Juice	Store with the Best Buy
Kroger: Food Lion: Harris Teeter:	

At Harris Teeter, you can be a VIC member, where you earn additional discounts. How much do you save per ounce of Simply Orange if you are VIC member?

Unit Rate HW

Name:_____ Date:_____

1. Find the unit rate for each situation.

a) Driving 180 km in 3 hours

b) 54 hot dogs for 18 people

c) 160 words typed in 4 minutes

d) $27.40 for 4 hours of work

e) $12.66 for 8 packages of juice boxes

f) $284 for a 4 day car rental

2. A student worked 5 days/week and 8 h/day. He earned $300/w eek. What was his hourly rate of pay?

6. Decide which is the better value based on the unit prices.

a) $25.00 for concert tickets for 2 people or $36.00 for concert tickets for 3 people.

b) $380 for a bus for 32 people or $420 for a bus for 38 people.

c) $4.25 for 4 L of milk or $2.55 for 2 L of milk

Name _____ Date _____

Recognizing Proportional Relationships - Independent Practice Worksheet

Solve all the problems.

1) Drew is an artist. He paints portraits. The table below shows the number of portraits painted in hours. Do the numbers in the table represent a proportional relationship?

Number of portraits	Time (In Hours)
1	5
2	10
3	15
4	20

2) This table shows the amount earned by Harry for selling cups of ice cream. Do the numbers in the table represent a proportional relationship?

Cups sold (km)	Earnings ($)
3	12
5	20
7	28
9	36

3) Fred wrote notes during an examination. The table below shows number of pages written in relation to the time it took to make the notes (in hours). Does the table represent a proportional relationship?

Notes (pages)	Time (In Hours)
8	16
9	18
10	20
11	23

Name _____ Date _____

4) Alice went to market and bought comics. The table below shows the price for different numbers of comics. Do the numbers in the table represent a proportional relationship?

Number of Comics	Price (Dollars)
2	6
4	12
6	16
8	24

5) A ferry has to transport bikes on an island. The table below shows the number of bikes transported and the number of trips made by ferry. Do the numbers in the table represent a proportional relationship?

Number of bikes	Number of trips
10	5
12	6
14	7
16	8

6) The table below gives the distance covered by a train over time. Do the numbers in the table represent a proportional relationship?

Distance (km)	Time (In Hours)
50	10
60	12
70	14
80	16

7) Daisy made an envelope from sheets of paper. The table below shows the number of envelopes made by the number of sheets. Do the numbers in the table represent a proportional relationship?

Number of envelopes	Number of sheets
1	2
2	4
3	6
4	12

Name _____ Date _____

8) Joe made a fruit pie. The table below displays the number of fruits he used to make the pies. State "Yes", if the table represents a proportional relationship?

Number of pie	Number of fruit
2	10
3	15
4	24
5	25

9) Betty makes omelettes. The table below shows number of omelettes made and the number of eggs used. Does table represent a proportional relationship?

Number omelette	Number of eggs
5	10
6	12
7	14
8	24

10) Kelly goes on a morning walk. The table below shows the number of meters ran by Kelly over time. Do the numbers in the table represent a proportional relationship?

Distance (m)	Time (In minutes)
3	12
4	16
5	20
6	24

Name: _____ Date: _____ Core: _____

Are they proportional?

Look at each graph and select 2 ordered pairs (not including the origin) make a table that corresponds to the graph. Decide if the graph is proportional or not.

Graph #1

Money spent on stamps	Total number of stamps

Proportional? _____

Graph #2

Months	Total books read

Proportional? _____

Graph #3

Number of seed packets	Number of flowers

oportional? _____

Graph #4

Sticks of butter	Number of cakes

Proportional? _____

Graph #5

Cups sold	Earnings

Proportional? _____

Graph #6

Time	Height

Proportional? _____

Graph #7

Attendees	Cost

Proportional? _____

Graph #8

Weight	Cost

Proportional? _____

Graph #9

Practices	Distance

Proportional? _____

Graph #10

Cups of sugar	Number of pies

Proportional? _____

Graph #11

Taxable amount	Amount of tax

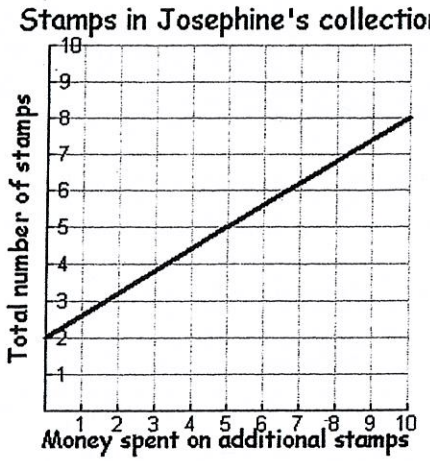
Proportional? _____

Graph #12

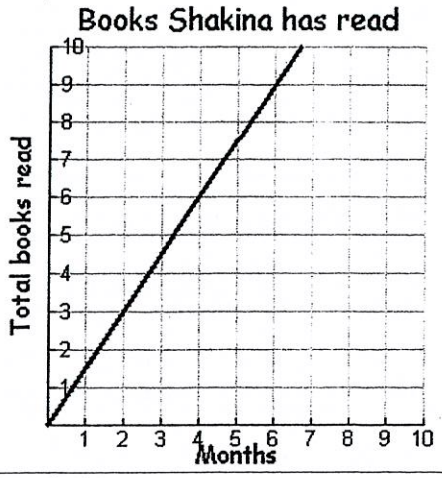
Time in class	Number of pages

Proportional? _____

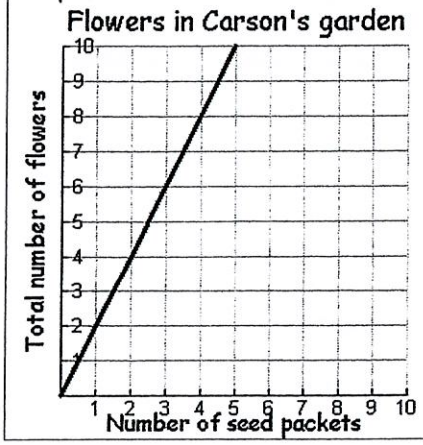
Graph #1



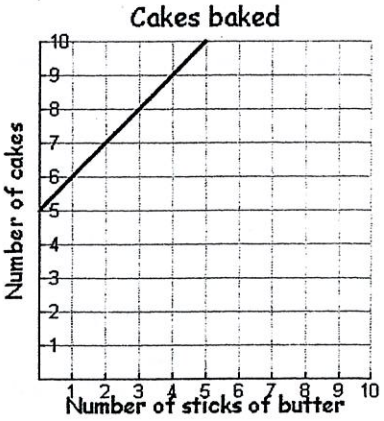
Graph #2



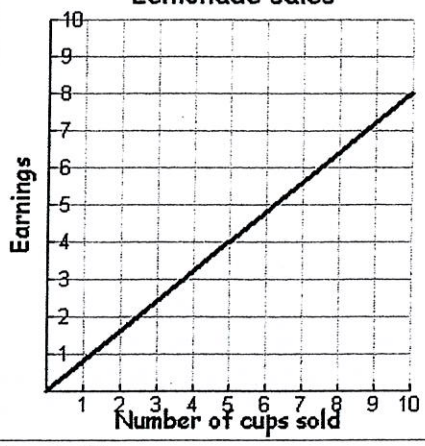
Graph #3



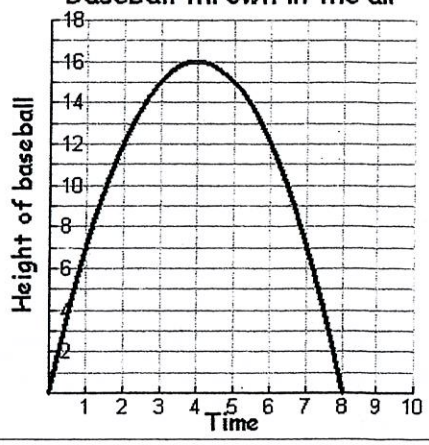
Graph #4



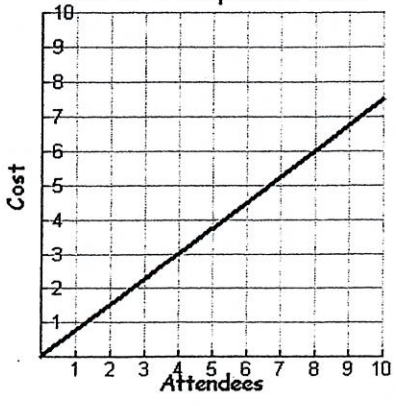
Graph #5



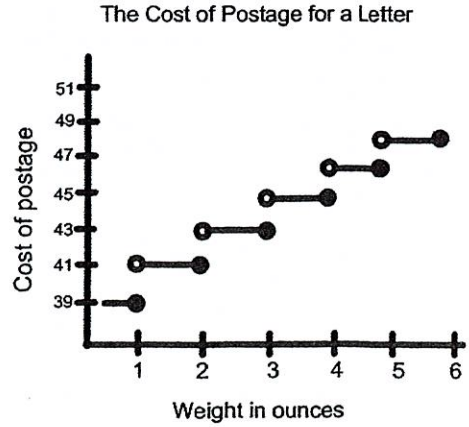
Graph #6



Graph #7



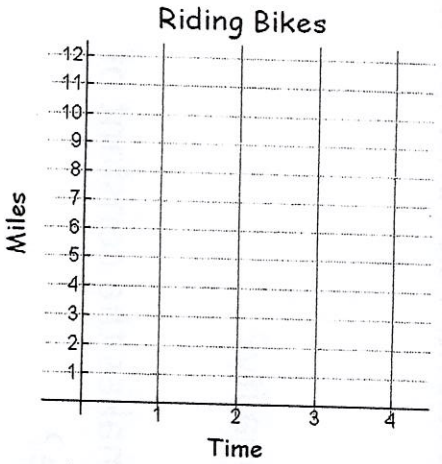
Graph #8



Unit Rates and Proportional Relationships

Grandma Betty rode her bike on the Tobacco Trail. It took her 4 hours to ride 12 miles. Assume she rode at a constant rate of speed during her exercise.

Time (x)	Miles(y)
4	12



You move up _____ units for each 1 unit you move to the right.
You move up 2• _____ units for each 2 units you move to the right.
You move up 3• _____ units for each 3 units you move to the right.
You move up 4• _____ units for each 4 units you move to the right.

Starting from (0, 0), to get to a point (x, y) on the graph, you will go up x•___ units for every x units you have moved to the right.

Therefore, y = x•___, so y = ____

What is the ordered pair where x = 1? (1, ____)
What does it stand for?

What is the constant of proportionality? What is it equal to?

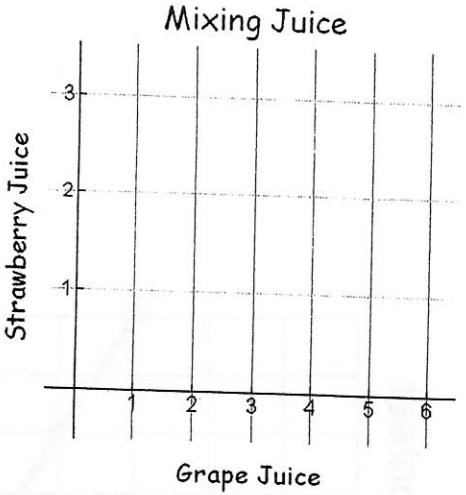
Grandma Betty doesn't always ride 12 miles, but she always goes the same pace. Use your equation to find the missing information based on the given information of different exercise sessions.

A. Grandma Betty rode for 6 hours and 30 minutes. How far did she go?

B. Grandma Betty rode her bike for 15.75 miles. How long did it take her? Can you convert your answer to hours and minutes?

For every 6 cups of grape juice, mix in 3 cups of strawb[illegible] juice.

Cups of grape juice (x)	Cups of strawberry juice (y)
6	3



You move up _____ units for each 1 unit you move to the right.
You move up 2• _____ units for each 2 units you move to the right.
You move up 3• _____ units for each 3 units you move to the right.
You move up 4• _____ units for each 4 units you move to the right.

Starting from (0, 0), to get to a point (x, y) on the graph, you will go up x•___ units for every x units you have moved to the right.

Therefore, y = x•___, so y = ____

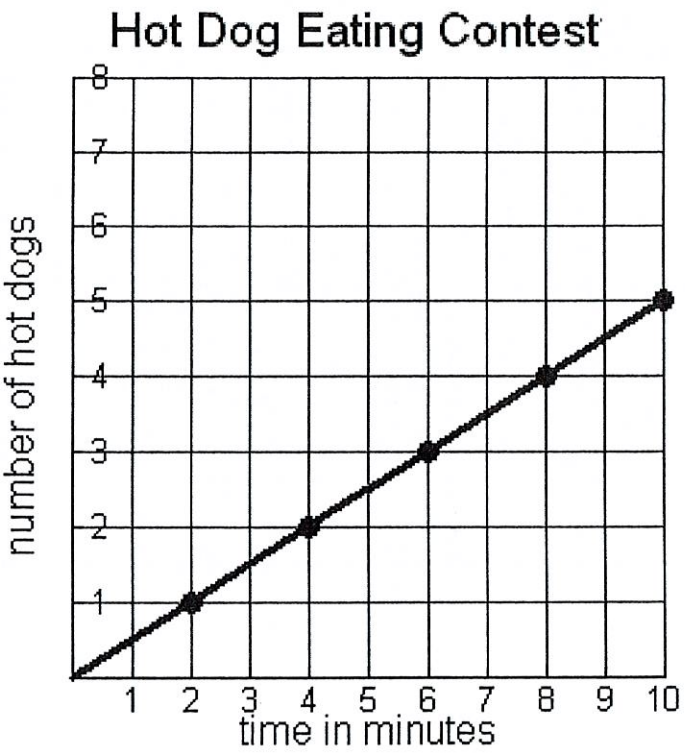
What is the ordered pair where x = 1? (1, ____)
What does it stand for?

What is the constant of proportionality? What is it equal to?

You want to make different sized batches of juice that have the same exact flavor and strength as your original batch. Use your equation to find the missing amount of juice needed.

A. 23 cups of grape juice. How many cups of strawberry juice will you need?

B. 19 cups of strawberry juice. How many cups of grape juice will you need?



The graph above represents one of the contestants' data at a hot dog eating contest. Answer the following questions based on your knowledge of ratios and proportional relationships.

1. Does the graph represent a proportional relationship? How do you know?

2. What is the constant of proportionality?

3. What ordered pair on the graph makes the constant of proportionality easy to determine?

4. What does the ordered pair (0,0) represent in this graph?

5. What is an equation that would represent the relationship shown in the graph?

Notes: Setting up Proportions from Word Problems

1. A recipe calls for 6 eggs to make 15 pancakes. How many eggs are needed to make 70 pancakes?	2. Sandra drove 126.2 miles in 2 hours at a constant speed. How long would it take her to drive 189.3 miles at the same speed?
3. Carmen earned $144 for 18 hours of work. At this rate, how much will she earn for 36 hours of work?	4. Nine apples cost $2.61. How much will 4 dozen apples cost?
5. In order to determine her pulse rate, Sondra's nurse count 23 beats in 20 seconds. At this rate, how many beats would she have in 1 *minute*?	6. Parker uses a cookie recipe that requires $\frac{3}{4}$ cup of sugar to make 33 cookies. If Parker only wants to make 11 cookies, how much sugar should he use?

Name: _____

Date:_____Period:____

Ratios, Rates, and Proportions- Making a Big Breakfast

You want to surprise your family with a big breakfast, but first, you must go grocery shopping! Your task is to get to the store, purchase the items your family needs, and to save as much money as possible. Solve each problem below, circling your final answer!

a. You don't have a driver's license yet, so you have to walk to the store. You can walk 1.5 miles in 24 minutes. If it took you 32 minutes to walk to the store, how far away is the grocery store?	b. You know you want to make pancakes. The pancake recipe calls for 2 eggs for every 5 servings of pancakes. If you want to make 15 servings, how many eggs will you need to purchase?
c. You need to purchase sugar. You can buy a 3-pound bag of sugar for $4.56 or a 5-pound for $7.30, but to find the best deal, you must find the unit price for each size. What is the unit price for the 3-pound bag of sugar? What is the unit price for the 5-pound bag of sugar?	d. Which size bag is the better deal? How much do you save per pound?
e. One last thing that you need is potatoes. Again, the store sells different sized bags of potatoes. You must purchase the bag that is the better deal. You can purchase the 5-pound bag for $4.15 or an 8-pound bag for $6.32. What is the unit price for the 5-pound bag of potatoes? What is the unit price for the 8-pound bag of potatoes?	f. Which size bag is the better deal? How much do you save per pound?
g. You also enjoy making egg omelets with cheese. Your recipe calls for 0.4 cups of cheese for every 3 eggs that you use in your omelets. If you are making omelets using 20 eggs, how many cups of cheese would you need? Put your final answer in fraction form.	h. Loaded with bags, your walking rate decreased. If you can now walk .5 miles in 11 minutes, how long will it take you to walk the 2 miles home from the store?
i. Time to cook! It usually takes you about 40 minutes to cook for your family of 4. You have a lot of family in town though and you have to cook for 14 people. How many minutes will it take you to cook for 14 people? Can you convert that to hours and minutes?	j. Your sister wants to help make the pancakes by adding the strawberries. If the recipe calls for 3 chopped strawberries for every 4 servings, would her following proportion work to find the number of chopped strawberries in 15 servings? $\frac{3}{4} = \frac{15}{x}$ In 2 to 3 *complete* sentences, please explain why you think she is right or why you think she is wrong. If you believe that she did something wrong, how could you set up the proportion to correct her?

E.Duffy

Proportion Word Problems

1. Carol spends 17 hours in a 2-week period practicing her culinary skills. How many hours does she practice in 5 weeks?

2. In the typing world, 80 words per minute is considered acceptable. How many words per 30 minutes is this?

3. In the year 2000, there were 8.7 deaths per 1000 residents in the United States. If there were 281,421,906 residents in the U.S. during 2000, how many people died that year?

4. In a shipment of 400 parts, 14 are found to be defective. How many defective parts should be expected in a shipment of 1000?

5. Joseph drives 125 miles in $2\frac{1}{2}$ hours. At the same rate, how far will he be able to travel in 6 hours?

6. A piece of cable 8.5 cm long weighs 52 grams. What will a 10-cm length of the same cable weigh?

7. A rainstorm produced a rainfall of 2 inches per hour. How many hours would it take to get a rainfall amount of one foot?

8. A snowstorm dumped 18 inches of snow in a 12-hour period. How many inches were falling per hour?

9. Mary can read 22 pages in 30 minutes. How long would it take her to read a 100 page book? Write your answer in hours and minutes and round to the nearest minute, if needed.

10. It takes about me 25 minutes to make out a test for a mathematics class. How long will it take to make out tests for all five of my classes?

11. The chance of a woman getting breast cancer in her lifetime is 1 out of 8. At this rate, how many women in a classroom of 32 women would be expected to come down with breast cancer in her lifetime?

12. If 15.9 out of every 100 pregnant women in Georgia deliver their babies by C-Section, how many pregnant women out of 25,250 would be expected to deliver by C-Section?

13. A company's quality control department found and average of 5 defective models for every 1000 models that were checked. If the company produced 60,000 models in a year, how many of them would be expected to be defective?

14. To determine the number of deer in a forest, a forest ranger tags 280 and releases them back into the forest. Later, 405 deer are caught, out of which 45 of them are tagged. Estimate how many deer are in the forest.

15. An employee working at an electronics store earned $3582 for working 3 months during the summer. What did the employee earn for the first two months?

16. A worker can complete the assembly of 15 tape players in 6 hours. At this rate, how many can the worker complete in a 40-hour work week?

17. The ratio of men to women at a class is 6 to 5. How many women students are there if there are 3600 men?

18. If 3 pounds of apples costs $0.90, how much will 10 pounds cost?

19. You find that your watch gains 2 minutes in 6 hours. How much will it gain in 3 days?

20. Sirloin steak costs $2.99 per pound. How much will 3.4 pounds cost?

21. A yard of fabric costs $12.99. How much will 2 feet cost?

22. Hurricane Katrina dropped about 14 inches of rain over a 48 hour period. How much rain is this per hour? (Round your answer to the nearest tenth.)

23. It takes about 20 minutes to grade a student's paper. How long, in **hours**, does it take to grade papers for a class of 25 people?

24. A doctor sees each of her patients for 25 minutes during a typical appointment. How many patients can she see in a typical $7\frac{1}{2}$ hour day?

25. If a trip between work and home takes 15 minutes each way, how much time will be spent in a 5-day work week traveling back and forth to work? (Assume that at no point does the employee have to go home and come back within the same day.)

Similar Figures

Name:_____

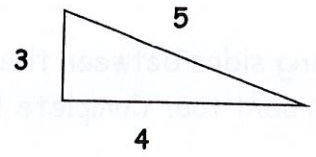
Date:_____Period:____

Similar Figures:

Corresponding Sides and Angles:

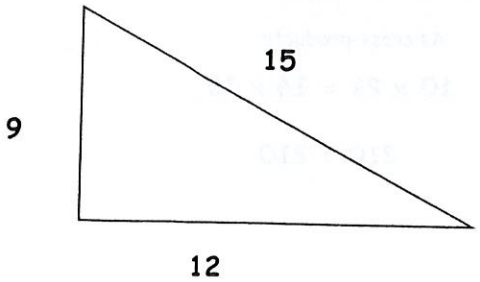
Proportional:

In the triangle below, the ratios or relationship between the sides can be described as follows:



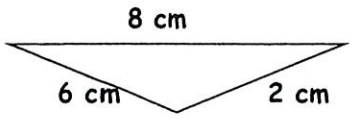
3 : 4 : 5

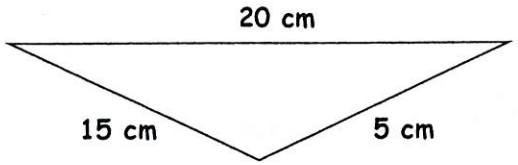
In order for another triangle to be proportional to this one, its sides would have to maintain the same relationship. For example look at the following triangle. If I set up the relationship for this triangle and then reduce it by a common factor, what happens?



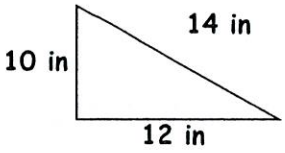
Try this:

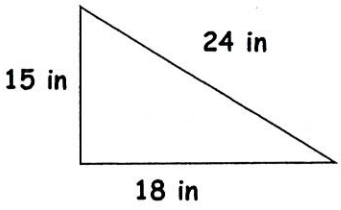
EXAMPLE 1: Compare the sides below and prove or disprove if these triangles are similar using the side relationships.





EXAMPLE 2: Compare the triangles below and prove or disprove if these triangles are similar using the side relationships.

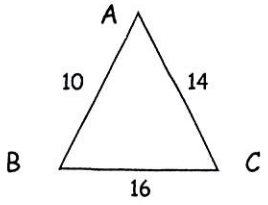




Another way we could look at these triangles is to compare corresponding sides between the triangles. The triangles below have corresponding angles that are congruent too. Complete the following statements about triangle ABC and triangle MNP.

$\overline{AB}$ corresponds to _____ $\overline{NP}$ corresponds to _____

$\overline{CB}$ corresponds to _____ $\overline{MP}$ corresponds to _____



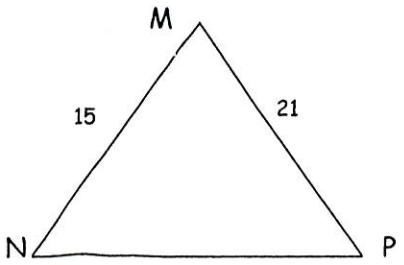
So the corresponding ratios between these triangles would be:

$\frac{10}{15}$ and $\frac{?}{21}$; Written as $\frac{10}{15} = \frac{14}{21}$;

As cross-products:

$10 \times 21 = 14 \times 15$

$210 = 210$

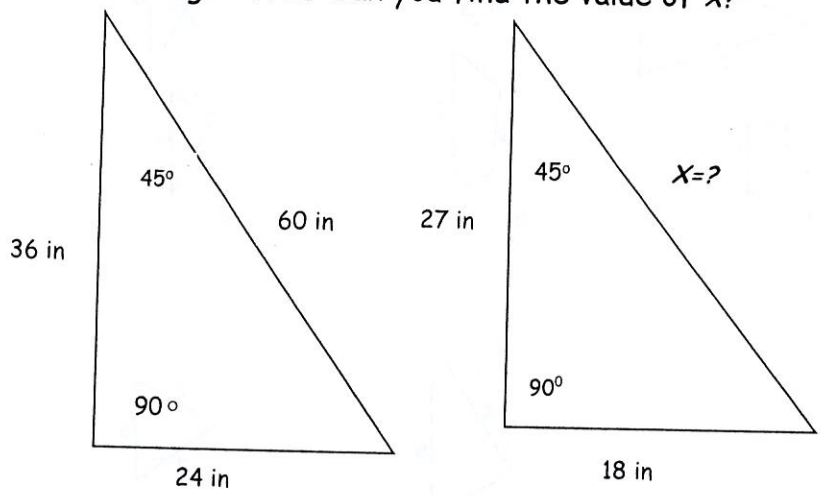


STATEMENT:

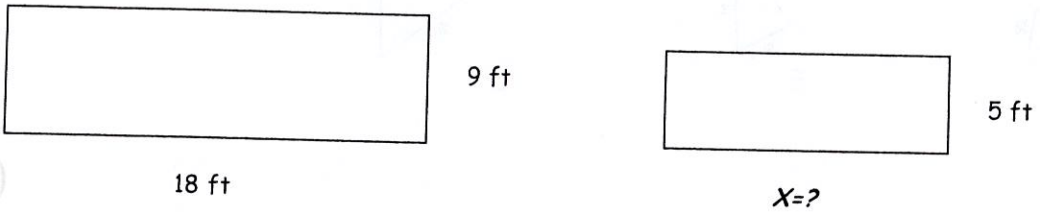
So you can also use this method to prove if two shapes are similar. *REMEMBER that two shapes are simliar if their corresponding sides are proportional.

We can use this same technique to find the missing side when we are told that two shapes are similar. Try to find the missing pieces in the figures below:

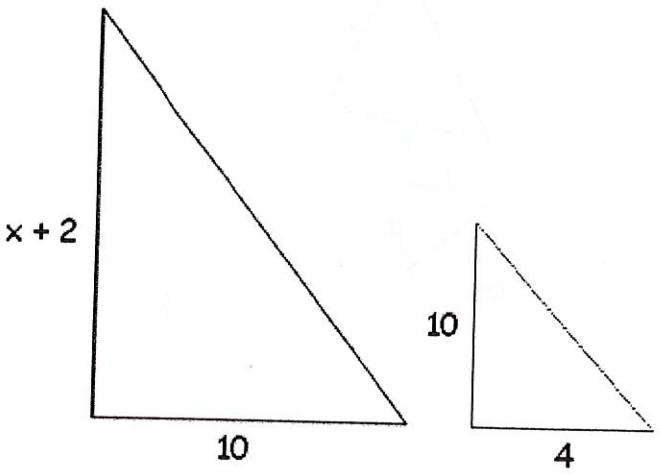
Triangle ABC is similar to triangle XYZ. Can you find the value of *x*?



The two rectangles are similar. Find the missing side. Can you find more than one way to find the missing side?



What if there is a binomial? How can you solve for x?



Kuta Software - Infinite Pre-Algebra

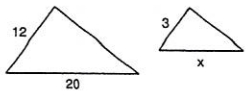
Name_____

Similar Figures

Date_____ Period____

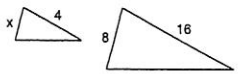
Each pair of figures is similar. Find the missing side.

1)



2)

3)



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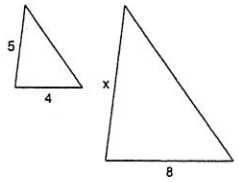

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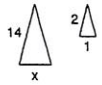

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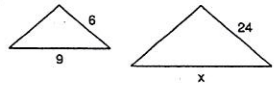
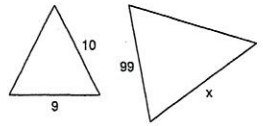


7)



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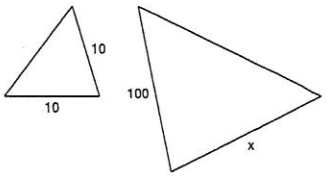

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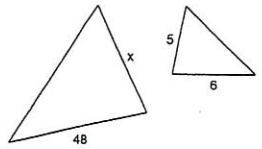

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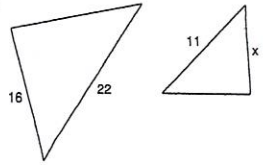

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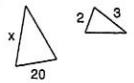

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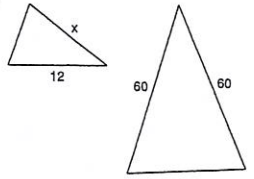

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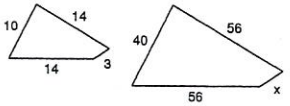

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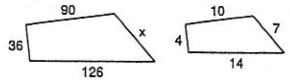

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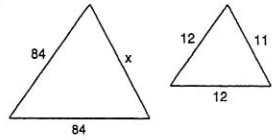
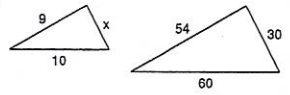


16)



U5-2 NOTES Scale and Scale Factor Notes

Scale-

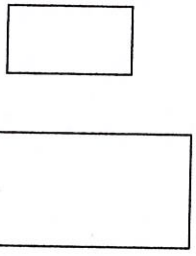
Scale Factor-

Ex. On a map of Florida, the distance between two cities in 10.5 cm. What is the actual distance between them if the scale is 3cm = 80 mi?

Ex. A model house is 16 centimeters wide. If it was built with a scale of 4 cm : 15 feet, then hose wide is the actual house?

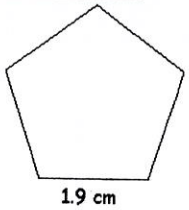
Ex. Johnny used a map to get to his Grandma's house that used a scale of 2 cm : 85 miles. If Johnny actually drove 637.5 miles, how far apart was Johnny's house from his Grandma's house on the map?

Ex. A photograph was enlarged and made into a poster using a scale factor of 5. The photograph is 5 inches by 11 inches. What will the *perimeter* of the poster be?



Ex. A car that is 15 feet long is going to be reduced by a scale factor of 60 to produce a model toy car. What is the length of the model toy car?

Ex. In the scale drawing below, **each side** is 1.9 cm long. If the drawing is going to be enlarged by a scale factor of 20, what is the *perimeter* of the enlarged object?



U5-1 HW - Application of Similar Figures

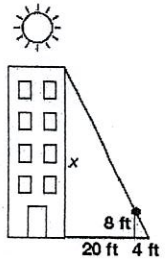
Name:_____

Date:_____Period:___

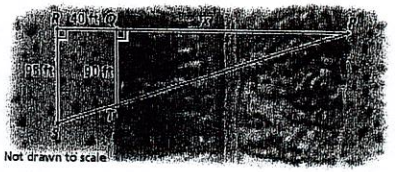
1. At any given time of day, if you are standing outside, the shadow you cast will be *proportional* to the shadows of other objects. So...if we want to know the height of a very tall tree (without climbing it) we can find that height using other measures. Draw a picture of the situation.

2. You measure the mailbox in front of the school and find that it stands 3.5 ft tall and is casting a shadow of 2 ft. You want to find the height of the flagpole which is casting a shadow of 12 ft. Find the height of the flagpole. Draw a picture creating similar figures and label then solve.

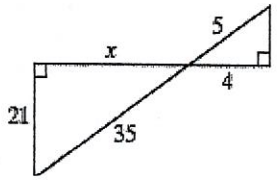
3: What is the height of the building?



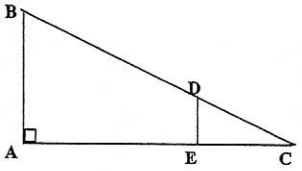
4: Solve for x.



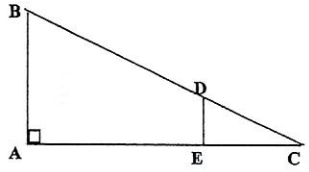
5:



6: Triangle ABC is similar to Triangle EDC. *AB* = 18 cm. *DE* = 6 cm. Segment *EC=16 cm.* Find the length of AC.



7 Triangle ABC is similar to Triangle EDC.
If AB = 14 , AC = 31.5, and DE = 4, what is the length of AE? *HINT: Find EC first.*



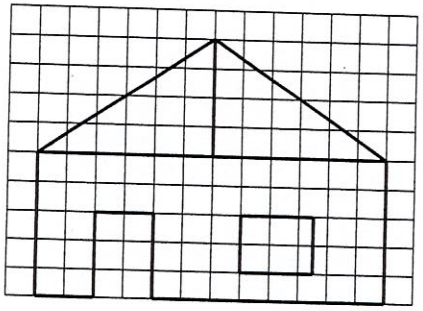
Name: _____ Class: _____ Date: _____

Using Scale Factor

Using the map distances, find the actual distance if the map uses the scale 4 in: 30 mi.

1. 2 inches
2. 7 inches
3. 5.5 inches
4. 10 inches

The figure below is a scale drawing of a playhouse. In the drawing, the side of each square represents two and a half feet. Find the actual length of each segment.



5. The width of the house.
6. The height of the house.
7. The height of the first floor.
8. The height of the roof.
9. The width of the door.
10. The height of the door.
11. The width of the window.
12. The height of the window.

Using the map distances, find the actual distance if the map uses the scale 2 cm: 21 km.

13. 8 cm
14. 3.6 cm
15. 7.5 cm
16. 1 cm

A picture uses a scale of 1 in: 15 ft. Find the picture length for each actual length.

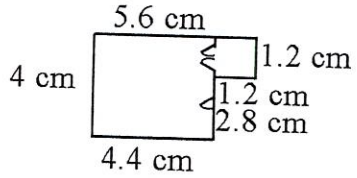
17. 150 feet
18. 300 feet
19. 33.75 feet
20. 15,000,000 feet

21. A scale drawing of a rectangular room has a length of six inches and a width of 4 inc[illegible]ne drawing uses a scale of one inch to three feet. Find the cost to carpet the room if carpeting costs $5.5[illegible] square foot.

22. Your Social Studies teacher has asked you to draw a map of North Carolina. You decide that the scale you will use is 1 inch = 30 miles. The actual distance from Charlotte to Raleigh is 144 miles. How far apart should the cities be on your map?

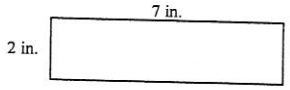
23. When Jermaine designed his dream house, he used a scale of .5 inch = 2 feet. He plans to purchase carpet for the actual living room with dimensions 3 inches by 5 inches in his model. The carpet sells for $5.95 per square foot. How much will it cost Jermaine to carpet his living room?

24. Julie shows the scale drawing of her room below. If each 2 cm on the scale drawing equals 5 ft, what are the actual dimensions of Julie's room?



25. Reproduce the drawing above at 3 times its current size.

26. If the rectangle below is enlarged using a scale factor of 1.5, what will be the perimeter and area of the new rectangle?



27. Mariko has an 80:1 scale-drawing of the floor plan of her house. On the floor plan the dimensions of her rectangular living room are $1\frac{7}{8}$ inches by $2\frac{1}{2}$ inches. What is the area of her real living room in square feet?

Name_____

Similar Figure Word Problems

Date_____ Period____

Answer each question and round your answer to the nearest whole number.

1) A 6 ft tall tent standing next to a cardboard box casts a 9 ft shadow. If the cardboard box casts a shadow that is 6 ft long then how tall is it?

2) A telephone booth that is 8 ft tall casts a shadow that is 4 ft long. Find the height of a lawn ornament that casts a 2 ft shadow.

3) A map has a scale of 3 cm : 18 km. If Riverside and Smithville are 54 km apart then they are how far apart on the map?

4) Find the distance between Riverside and Milton if they are 12 cm apart on a map with a scale of 4 cm : 21 km.

5) A model house is 12 cm wide. If it was built with a scale of 3 cm : 4 m then how wide is the real house?

6) Oak Grove and Salem are 87 mi from each other. How far apart would the cities be on a map that has a scale of 5 in : 29 mi?

7) A map has a scale of 2 in : 6 mi. If Clayton and Centerville are 10 in apart on the map then how far apart are the real cities?

8) A statue that is 12 ft tall casts a shadow that is 15 ft long. Find the length of the shadow that a 8 ft cardboard box casts.

Answer each question and round your answer to the nearest tenth.

9) A model house has a scale of 1 in : 2 ft. If the real house is 26 ft wide then how wide is the model house?

10) A 6.5 ft tall car standing next to an adult elephant casts a 33.2 ft shadow. If the adult elephant casts a shadow that is 51.5 ft long then how tall is it?

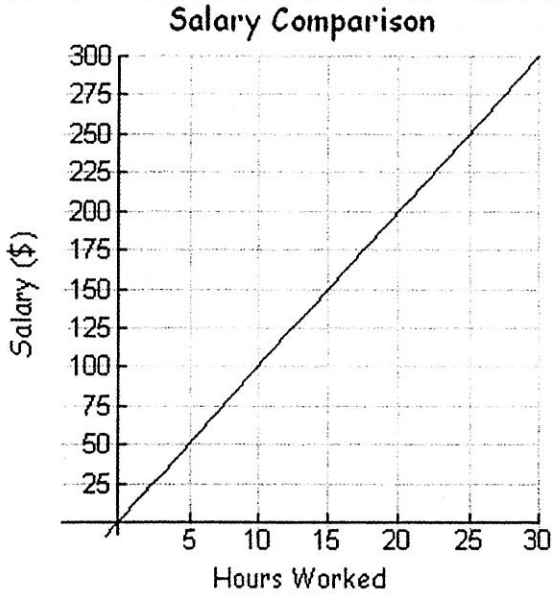
11) If a 42.9 ft tall flagpole casts a 253.1 ft long shadow then how long is the shadow that a 6.2 ft tall woman casts?

12) Georgetown and Franklin are 9.7 in apart on a map that has a scale of 1.1 in : 15 mi. How far apart are the real cities?

Name: _____ Date:_____ Core:____

U5-3 Graphs versus Equations

1. Pilar has two job offers and wants to take the job with the highest pay. The pay scale for company A is shown in the graph. The pay scale for Company B is given by the boxed equation where P is the pay, and h represents the number of hours worked.



$$P = 9h$$

1. Based on the graph, how much did Pilar make after working 15 hours? 20 hours?

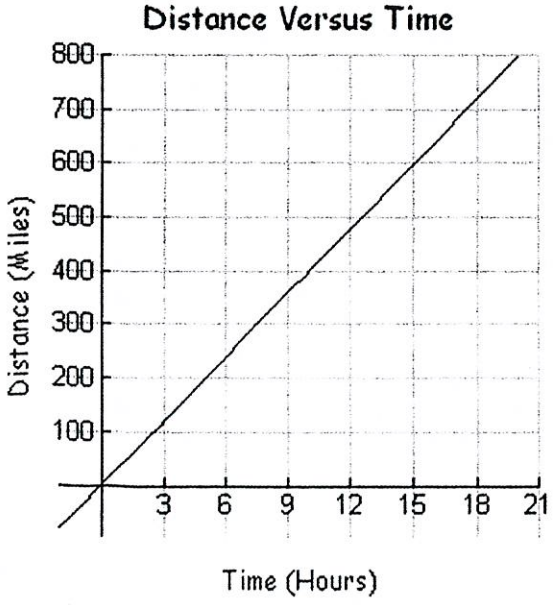
Hours	Salary
15	
20	

2. Can you use the table above to determine the constant of proportionality? What is the constant and how did you find it?

3. What is the equation that is represented by the graph?

4. Which company offers the highest pay, and what is the hourly rate for that company?

2. Kelsey recorded the speed of two storms by mapping how long they took to move certain distances. The speed of Storm A is shown in the graph. Storm B's speed is given by the boxed equation where D is the distance in miles, and h represents the time in hours.



$$D = 25h$$

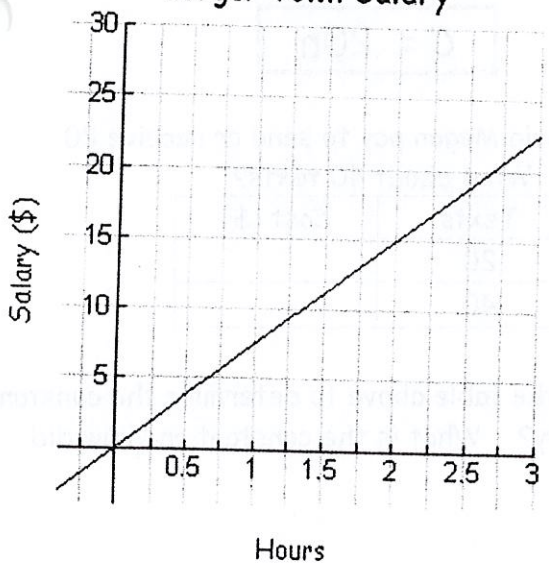
1. Can you find an ordered pair that goes through two whole number values?

2. Use that point help you to determine the constant of proportionality. (What do you have to do to x to get to y?)

3. What is the equation that is represented by the graph?

4. Which storm is moving faster? What is the speed of that storm in miles per hour?

3. Paco has two job offers at Burger Town and wants to take the job with the highest pay. The pay scale for cook is shown in the graph. The pay scale for taking customer orders is given by the boxed equation where P is the pay, and h represents the number of hours worked.

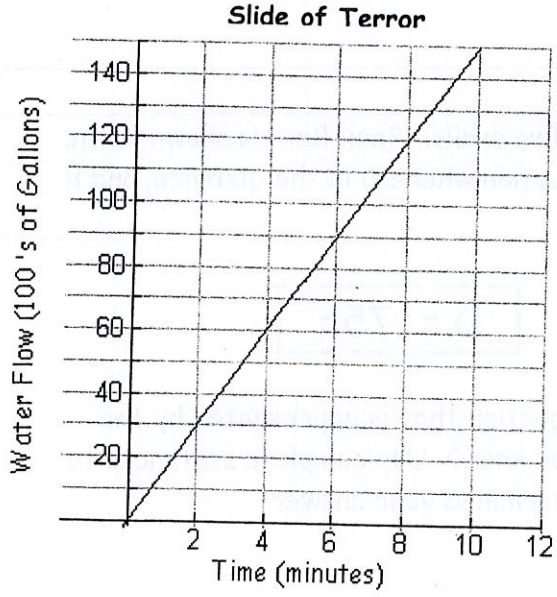


$$S = 8h$$

1. What is the equation that is represented by the graph? How do you know? Use complete sentences to prove how you determined your answer.

2. Which job offers the highest pay, and what is the hourly rate for that job?

4. Waterslides at WaterRapids Water Park pump different amounts of water through the slides. Slide of Terror is shown in the graph. The amount of water pumped through Waterfall Alley the boxed equation where W is the water pumped, and m represents the number of minutes.



$$W = 2000m$$

Waterfall Alley

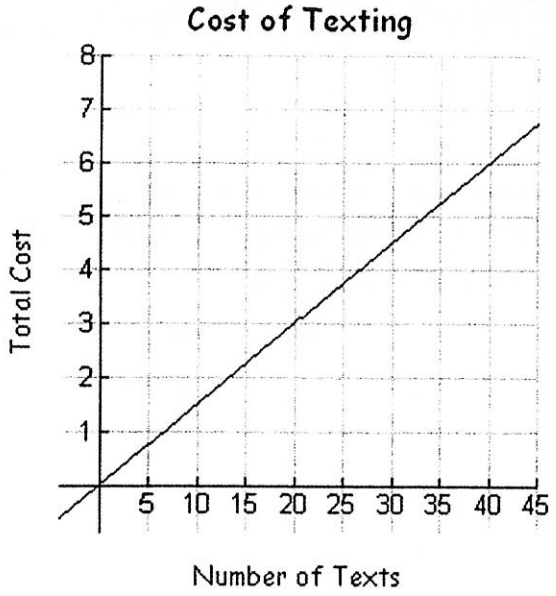
1. How many gallons of water did Slide of Terror pump through after 6 minutes? How do you know?

2. What is the constant of proportionality?

3. What is the equation that is represented by the graph?

3. If you were afraid of fast rides, which waterslide would you enjoy more? What is the rate of water speed for that water slide?

5. Megan's parents are allowing her to get a cell phone, but she must pay for the text message plan. Text Plan A is shown in the graph. The text plan cost for Text Plan B is given by the boxed equation where C is the cost, and n represents the number of texts sent and received.



$$C = .20n$$

1. How much would Megan pay to send or receive 20 texts in Plan A? What about 40 texts?

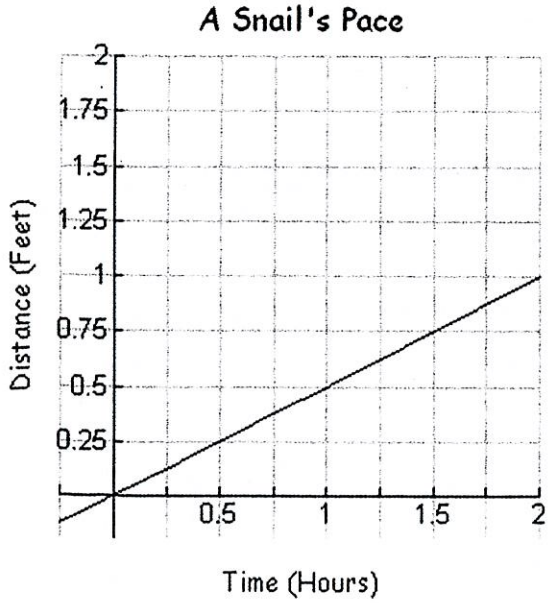
Texts	Cost ($)
20	
40	

2. Can you use the table above to determine the constant of proportionality? What is the constant and how did you find it?

3. What is the equation that is represented by the graph?

4. Which text plan would Megan select to ensure that she is saving the most money? How much is she paying for each text sent or received?

6. For her science project, Georgia recorded the speed of two snails. Snail Bert is shown in the graph. The speed of Snail Ernie is given by the boxed equation where D is the distance, and h represents the hours elapsed.



$$D = .75h$$

1. What is the equation that is represented by the graph? How do you know? Use complete sentences to prove how you determined your answer.

2. Which snail moves at a faster rate? What is the speed of each snail per hour?

26

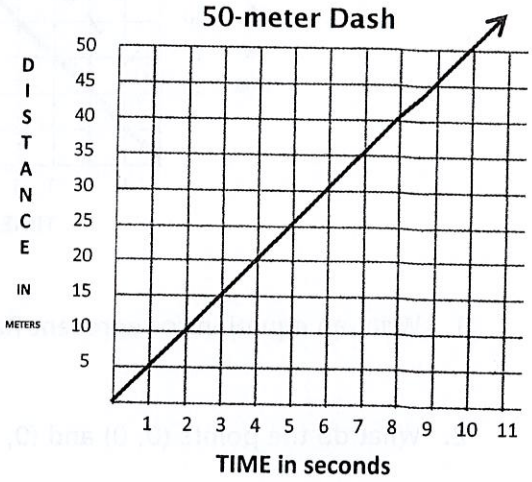
Name:_____

U5-3 CW Interpreting From Graphs

Date:_____Period:____

A relationship between two quantities is proportional if the ratio between the quantities is always the same unit rate. Proportional relationships can be represented by the equation $y = kx$, where k represents a constant. The graph of any proportional relationship will be a straight line through the origin.

Ramon's raced Angel and Carlos in a 50-meter dash.



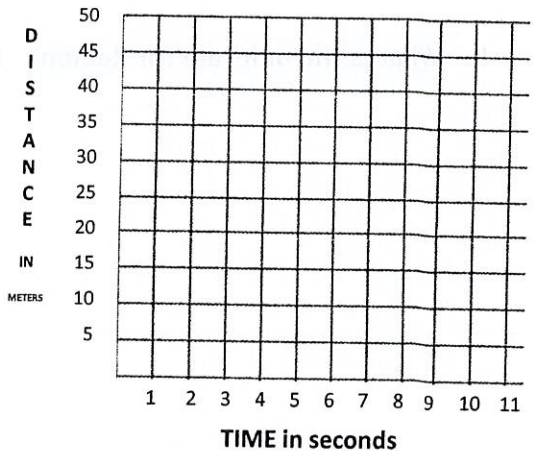
A. Ramon's results are shown on the graph.
   1. What does the shape of the graph tell you about Ramon's speed during the race?

   2. Explain how you can use the graph to find the unit rate for Ramon's speed.

B. Angel's data during the race can be described Using the equation y = 4.5x. Explain how you can find the unit rate for Angel's speed from the equation.

C. Carlos ran the race at a constant speed. The table shows the distances Carlos traveled during different times in the race.

Time (in seconds)	2	4	6	8
Distance (in meters)	9.5	19	28.5	38



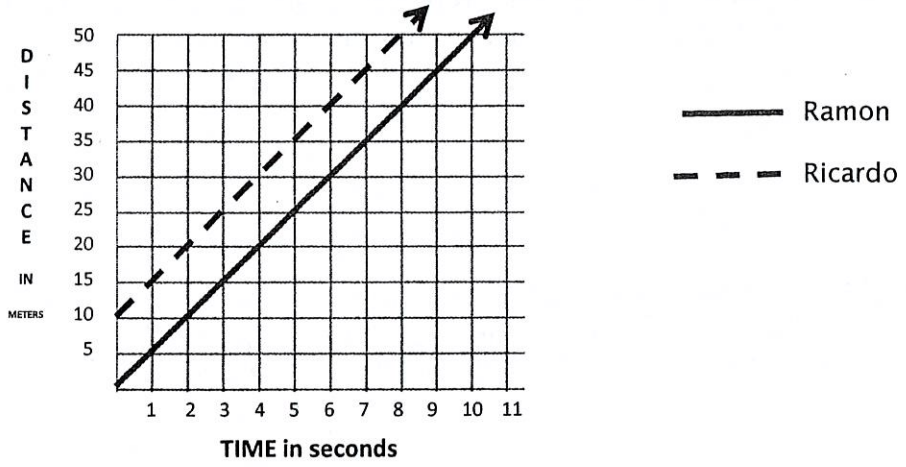
   1. Plot the data on the graph to show Carlos's speed during the race.

   2. Explain how you can use the graph to Find the unit rate for Carlos's speed.

D. Who won the race? Explain how you know.

Adapted from CONNECTED MATHEMATICS 2, CC Additional Investigations, Grade Eight, Investigation 2.

E. Suppose Ramon's twin brother, Ricardo, also runs in the race. Ramon gives Ricardo a 10-m head start in the race, and they run at the same speed. The graph below shows the results.



1. Write an equation to represent Ramon's position.

2. What do the points (0, 0) and (0, 10) on the graph represent?

3. Are the lines parallel? How do you know?

4. Ricardo runs at a constant rate of 5 m/sec and has a head start of 10 m. Write an equation of the line that represents Ricardo.

5. What is the unit rate for Ramon? Ricardo? Compare and make a statement.

Adapted from CONNECTED MATHEMATICS 2, CC Additional Investigations, Grade Eight, Investigation 2.

N _____ Date_____ Core_____

(Calculator Active)

Common Core Math 7 - Unit 5 Test Review

For each problem, be sure to follow the directions to determine the answer. All answers should be in simplest form.

1. A parking lot contains 18 American cars and 63 Foreign cars. Write the ratio of American cars to Foreign cars in simplest form.

2. During a trip, a car traveled 249.2 miles in 4 hours. How many miles per hour did the car travel?

3. Two drinks are on sale at a store. Drink A costs $1.28 for 16 ounces. Drink B costs $2.16 for 24 ounces. Determine the unit rates, and find which drink costs less per ounce.

4. Determine whether the following ratios are proportional:

$$\frac{14}{19} \text{ and } \frac{126}{131}$$

a. no b. yes

5. What factor is 12 multiplied by to create a proportional relationship? What is the value of n?

$$\frac{12}{n} = \frac{54}{72}$$

6. Seven bananas contain 3.5 milligrams of Vitamin B6. How many bananas contain 9.31 milligrams of Vitamin B6? Round to the nearest tenth.

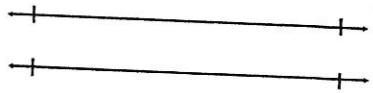
7. A worker at a tire shop can install 4 new tires in 1.3 hours. At this rate how long would it take the worker to install new tires for 75 cars if each car will receive 4 tires?

8. Terry paid $8.75 for 5 pounds of pears. At this rate how many pounds of pears could she buy with $61.25?

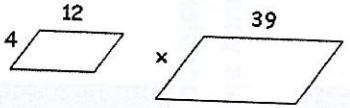
a. 7 lb b. 12 lb
c. 13 lb d. 35 lb

9. **Draw a tape diagram and use it to solve the problem.** Trail mix was made by combining almonds and grapes in a 4:3 ratio. If 21 ounces of grapes were used, how many ounces of almonds were used?

10. **Draw a double number line diagram and use it to solve the problem:** A group of students will be taking a field trip and there needs to be one chaperone for every 8 students. How many chaperones are needed for 136 students?



11. Two parallelograms are similar. The dimensions of the smaller parallelogram are 4 inches by 12 inches. If the larger parallelogram has a longer side length of 39 inches, use proportions to find the shorter side.



12. The scale of a map is 1.25 in. = 80 mi. If two cities are 4.75 inches apart on the map, how many miles apart are the cities?

13. A girl that is 4 feet tall is standing next to the Empire State Building in New York City. The girl's shadow is 3.2 feet long. If the Empire State Building is 1454 feet tall, how long would its shadow be?

14. The following chart shows the pay a babysitter made for different hours of work. Does the babysitter's pay represent a proportional relationship?

Number of hours	Pay
0	$0
2	$15
3	$24.75
11	$107.25

15. Determine if the following equation is proportional by creating a table.

$y = 7x + 2$

x	y
0	
1	
2	
3	

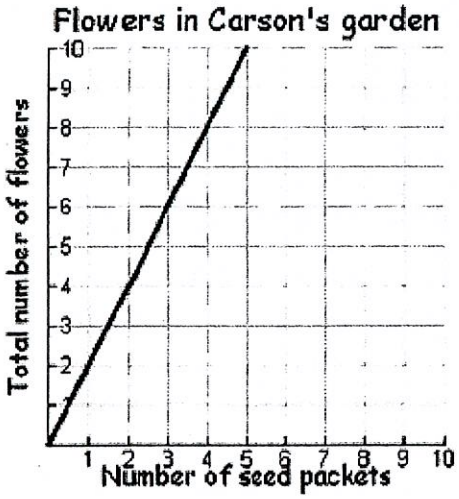
Is it proportional? Yes or No

16. Fill in the following table and identify the constant of proportionality.

Minutes	Words Typed
12	96
6	
3	
1	

Constant of Proportionality = _____

17. What is the constant of proportionality? What does it represent?



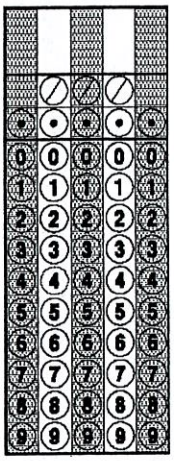
A. The constant of proportionality is 1/2. This means one seed packet will produce two flowers.

B. The constant of proportionality is 1/2. This means three seed packets will produce six flowers.

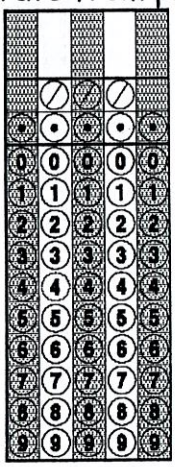
C. The constant of proportionality is 2. This means two seed packets will produce four flowers.

D. The constant of proportionality is 2. This means one seed packet will produce two flowers.

18 a) Bubble your answer for problem #6.



18 b) Bubble your answers for drink B's unit rate from problem #3.



19. North Carolina Public Schools spends about $126,000 for every 15 students. If Wake County Schools spends money proportionally to this amount, how much will they spend for 7500 students?

20. If the trapezoid below is enlarged using a scale factor of 6, what will be the ***perimeter*** of the new trapezoid?