y ÷ x to find K

equation y = KX

PROPORTIONAL RELATIONSHIPS UNIT STUDY GUIDE

Solve each of the problems below. These represent the types of questions on your test. Be sure to ask questions if you need more help with a topic.

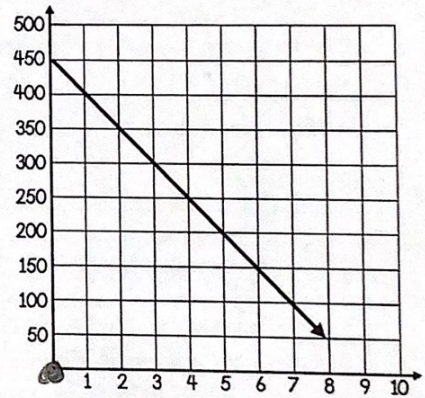## I CAN DETERMINE IF A RELATIONSHIP IS PROPORTIONAL.

1. Determine if the representations below are proportional (P) or non-proportional (NP).

a. __NP__

x	2	4	6	8	10
y	5	9	13	17	21

5÷2=2.5   9÷4=2.25   not the same

b. __P__

x	3	5	7	9	11
y	1.5	2.5	3.5	4.5	5.5

1.5÷3=0.5   2.5÷5=0.5 same!

c. __NP__ $y = 9x \left(+ \frac{1}{2} \right)$ equation is y = KX

d. __P__ $y = \frac{3}{4}x$

e. __NP__

↑ needs to go through origin

I CAN FIND THE CONSTANT OF PROPORTIONALITY.

2. Determine the constant of proportionality in each of the problems below.

a. y = 8x

y = KX

k = __8__

b.   y ÷ x

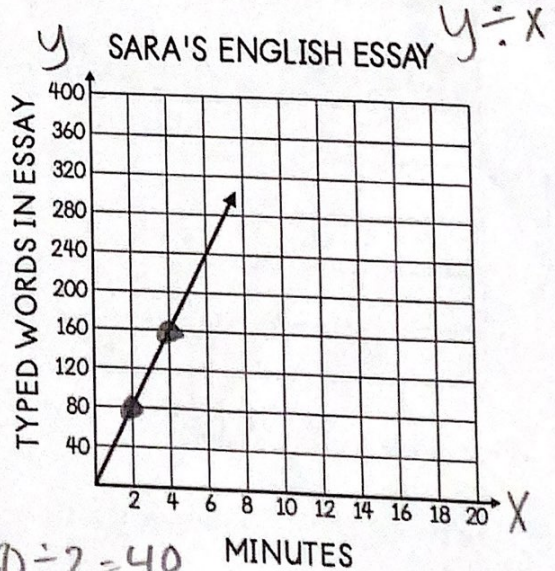| x	2	4	6	8	10
y	190	380	570	760	950

190 ÷ 2 = 95

k = __95__

c. A restaurant has an all-you-can-eat buffet. They charge $13.95 per person.

per 1 person so that is K

k = __13.95__

d.

y   SARA'S ENGLISH ESSAY   y ÷ x

TYPED WORDS IN ESSAY

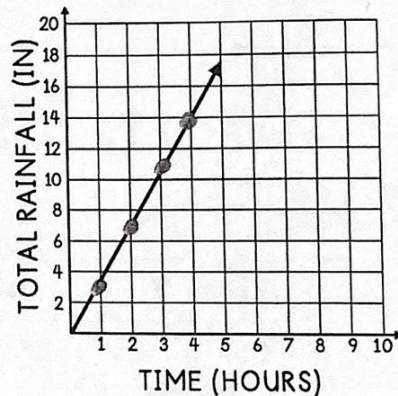MINUTES

80 ÷ 2 = 40
160 ÷ 4 = 40

k = __40__

I CAN USE TABLES TO REPRESENT PROPORTIONAL RELATIONSHIPS.

3. Complete the table and sketch a graph of the relationship between the inches of rainfall, y, and the number of hours, x. Then answer a-c.

$10.5 \div 3 = 3.5$

X HOURS	1	2	3	4	5
y TOTAL RAINFALL (IN)	3.5	7	10.5	14	17.5

$3.5 \cdot 2$ $3.5 \cdot 4$

a. What is the rate of change? Explain its meaning in the context of the situation.
The rate of change is 3.5. The total rainfall increases by 3.5 each hour.

b. Write an equation to represent the rainfall.
$y = 3.5x$

c. If the rainfall continues at this rate, how many inches of rain will fall after 6 hours?
21 inches

$3.5 \cdot 6 = 21$

I CAN WRITE EQUATIONS TO REPRESENT PROPORTIONAL RELATIONSHIPS.

4. An app developer projects that he will earn $20.00 for every 8 apps downloaded. Write an equation to represent the proportional relationship between the total earnings, y, and the number of apps downloaded, x.

$y \div x$

$20 \div 8 = 2.5$

$y = 2.5x$

5. As the x-value increases by 3, the y-value increases by 12.

$12 \div 3$

a. Find the rate of change. 4

b. Write an equation to represent the relationship between the x and y-values.
$y = 4x$

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6. The table below shows the relationship between the total sales, y, and the number of textbooks sold, x.

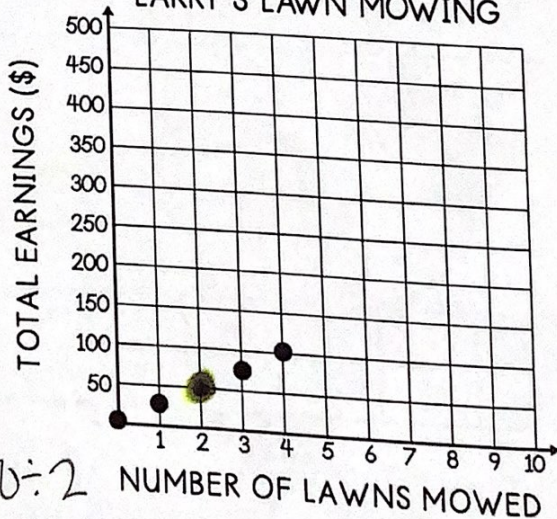| X TEXTBOOKS	y TOTAL SALES
4	$64.00
7	$112.00
9	$144.00
13	$208.00
20	$320.00

$64 \div 4 = 16$

a. What is the rate of change?
16

b. Write an equation to represent the relationship.
$y = 16x$

7.

LARRY'S LAWN MOWING

$50 \div 2$

a. What is the rate of change?
25

b. Write an equation to represent the relationship.
$y = 25x$

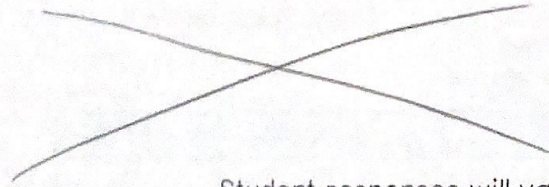## I CAN USE VERBAL DESCRIPTIONS TO REPRESENT PROPORTIONAL RELATIONSHIPS.

8. It takes Joe 12 minutes to ride a roller coaster four times. Create a table to represent the relationship between the total time, y, and the number of rides, x. $12 \div 4 = 3$

# OF RIDES	1	2	3	4
MINUTES	3	6	9	12

$3 \cdot 2$ $3 \cdot 3$

9. Write a situation to represent the equation y = 0.5x.

Student responses will vary.

10. Margie saves $15 of her allowance every two weeks. Circle any of the following that represent the relationship between the total amount saved, y, and the number of weeks, x.

$15 \div 2 = 7.5$

$50 \div 6 = 8.3\overline{3}$

A

| WEEKS	1	2	3
$ SAVED	7.50	15	22.50

B

y = 7.5x

C.

Maggie will save $50 after 6 weeks.

I CAN USE A GRAPH TO REPRESENT PROPORTIONAL RELATIONSHIPS.

11. Lacey drives 125 miles and uses 5 gallons of gasoline. Create a graph to represent the proportional relationship between the number of miles driven, y, and the amount of gasoline used, x. $125 \div 5 = 25$

GAS MILEAGE

(graph: NUMBER OF MILES vs NUMBER OF GALLONS)
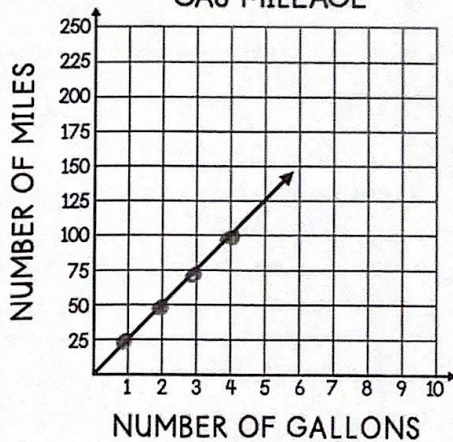
a. Write an equation to represent y, the number of miles traveled on x number of gallons of gas.
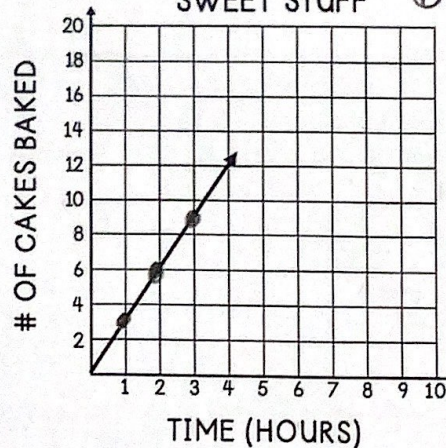
y = 25x

b. How many gallons of gas are necessary to travel 350 miles?

14 gallons

12. Sweet Stuff is a baking company that bakes specialty cakes. Sweet Stuff can bake 6 cakes in 2 hours. Create a graph to represent the relationship between y, the number of cakes baked, and x, the number of hours. $6 \div 2 = 3$

SWEET STUFF

(graph: # OF CAKES BAKED vs TIME (HOURS))

a. Write an equation to represent y, the number of cakes that can be baked in x hours.

y = 3x

b. In this situation, what does the ordered pair (4, 12) represent?

In 4 hours, 12 cakes will be made.

I CAN IDENTIFY PROPORTIONAL AND NON-PROPORTIONAL RELATIONSHIPS.

13. Bob's Deep Sea Fishing charges customers a flat fee of $75 plus $25 per hour spent at sea. Complete the table and graph to show the relationship between the cost of a fishing trip, y, and the number of hours spent on the boat, x. Then determine if the relationship is proportional. Explain.

HOURS	PROCESS	COST ($)
0	25(0) + 75	$75
1	25(1) + 75	$100
2	25(2) + 75	$125
3	25(3) + 75	$150
4	25(4) + 75	$175
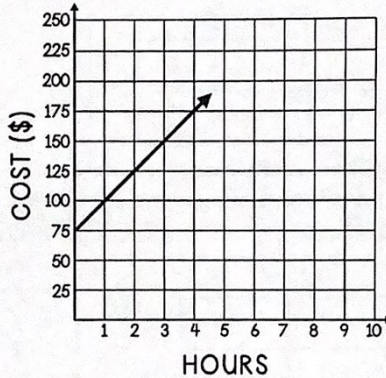
PROPORTIONAL?
This is a non-proportional relationship. The graph does not pass through the origin and $\frac{y}{x}$ is not constant.

I CAN COMPUTE UNIT RATES INVOLVING FRACTIONS.

14. Jeremy can row $\frac{2}{3}$ of a mile in $\frac{1}{2}$ of an hour. How long will it take him to row 1 mile?

$$\frac{1}{2} \div \frac{2}{3} = \frac{3}{4}$$

$\frac{3}{4}$ of an hour or 45 minutes

15. A lizard can lose its tail to escape a predator, and the tail will grow back at a constant rate. After 6 weeks, a lizard's tail has regrown to $3\frac{3}{4}$ inches long. Find the number of inches the tail grew each week.

$$3\frac{3}{4} \div 6 = \frac{5}{8}$$

The tail grew $\frac{5}{8}$ of an inch each week

16. Antonio is a chef at a bistro and is making tomato basil soup. The list of the ingredients is shown in the table below. Antonio accidently poured 1 cup of milk into his soup pot. List the amount of each ingredient Antonio needs to keep the ratios of the soup recipe equivalent.

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

multiply by reciprocal (flip the fraction) to equal 1.

TOMATOES	$1\frac{2}{3}$ cups •3
MILK	$\frac{1}{3}$ cup
BASIL	$\frac{1}{4}$ cup •3
CHICKEN BROTH	$1\frac{1}{2}$ cups •3

Tomatoes: _____5 cups_____

Basil: _____$\frac{3}{4}$ cup_____

Chicken Broth: _____$4\frac{1}{2}$ cup_____
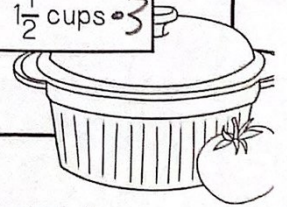
I'VE GOT IT!
What concepts can I ace on the test?

HELP!
What concepts do I need to study?