Name_____KEY_____

Unit #6 Test REVIEW – Unit Rate and Proportionality

No Calculator

Topic 1: Finding Unit Rates

1. Jenice takes her dog on walks everyday. It takes them 1/5 hour to walk 5/8 mile. Find their unit rate in miles per hour. $\frac{5}{8} \cdot \frac{5}{1} = \frac{25}{8} = 3\frac{1}{8}$ mph

2. Two containers filled with water are leaking. Container A leaks $\frac{3}{5}$ gallon in $\frac{3}{4}$ hour. Contain B leaks $\frac{1}{2}$ gallon in $\frac{1}{3}$ hour. Determine the unit rate for both to see which leaks faster.   B leaks faster

A) $\frac{3}{5} \cdot \frac{4}{3} = \frac{12}{15} = \frac{4}{5} \frac{gal}{hr}$ B) $\frac{1}{2} \cdot \frac{3}{1} = \frac{3}{2} = 1\frac{1}{2} \frac{gal}{hr}$

3. Jeremy can jog 1¾ miles in ¼ hour. Compute his speed in miles per hour.

$\frac{7}{4} \cdot \frac{4}{1} = \frac{28}{4} = 7 \text{ mi/hr}$

Topic 3: Tables

1. Find the constant of proportionality in the table.

x	2	4	6
y	1.47	2.94	4.41

$k = 0.735$

2. The table below shows the time if took for three different students to run. Only one student is running at a constant rate. Write an equation that can be used to represent y, the number of minutes taken to run x miles, for that student.

$y = 7.5x$

Miles	Larry	Jenn	Audrey
2	15 min	25 min	20 min
5	37.5 min	60 min	40 min
8	60 min	75 min	75 min

3) The table below shows a proportional relationship between cups and ounces. Fill in the missing blanks.

Objects	2	4	20
Oz	18	36	180

4) Bradley is filling a water bottle as shown below. How high would the water be after 15 seconds?

Time (seconds)	2	3	4	5	6
Height (cm)	14	21	28	35	42

$h = 7t$ $h = 105 \text{ cm}$
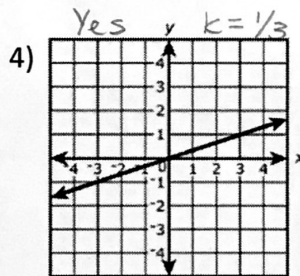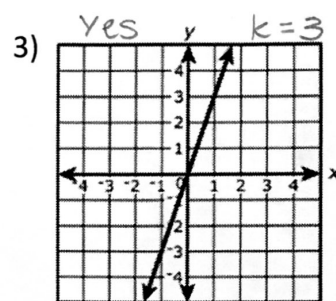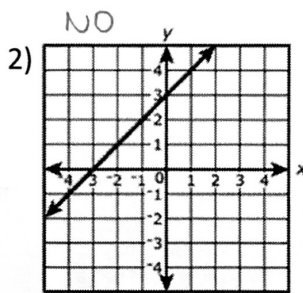
No Calculator

Topic 2: Proportionality

(1-4) Identify if the graphs and tables show proportional relationships (yes or no). If yes, find the constant of proportionality.

1)

x	-4	0	3	7
y	-14	0	13.5	24.5

No

2) NO

3) Yes   k=3

4) Yes $k = 1/3$
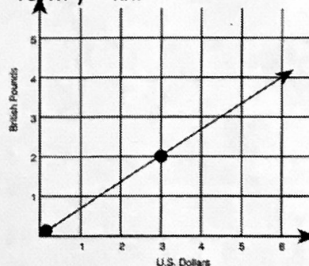

5) The coordinates of point P are (4,3) The coordinates of Point Q are (x,9)   x =12
What is the value of x, if the coordinates of point Q if points P and Q are in a proportional relationship?

Topic 4: Writing Equations

1) Write an equation for the graph in the form y = kx.

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

2) Write an equation relating x and y in the form y = kx
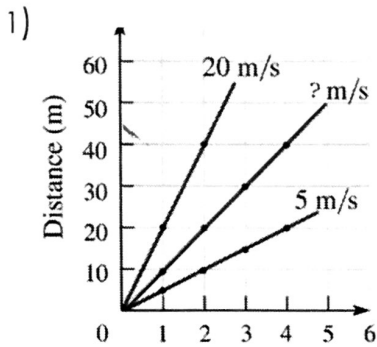
x	-5.4	-2.7	1.5	2.4
y	-1.8	-0.9	0.5	0.8

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

3) Write an equation relating a (apples) and c (cost).

Number of Apples	Total Cost
10	$2.00
20	$4.00
30	$6.00
40	$8.00

$c = 0.20a$

Topic 5: Graphs and Problem Solving
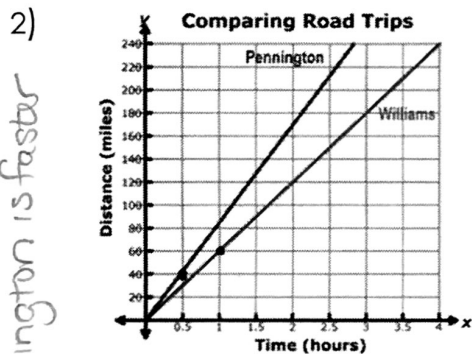
1)

Distance (m) vs Time (s): 20 m/s, ? m/s, 5 m/s

Part A
Explain why the graph does or does not represent proportional relationships between the variables d and t.   All proportional · origin, straight

Part B
What is the speed of the missing line?

$$\frac{30\ m}{3\ s} = 10\ m/s$$

2)

Comparing Road Trips — Pennington, Williams

Pennington is faster

Find the speed of each family. Which family is traveling at a faster speed?

$$P = \frac{40mi}{0.5hr} = 80mph \qquad W = \frac{60mi}{1hr}$$
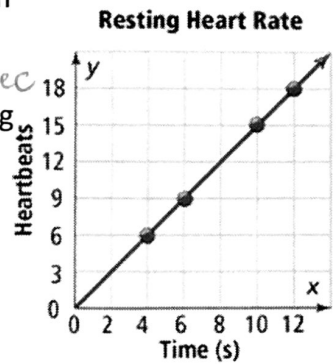
3) A. What is the unit rate in beats per second?

1.5 beats/sec

B. Write an equation relating beats (b) to seconds (s)

$$b = 1.5s$$

C. How many times would the heart beat in 20 seconds?

$$b = 30$$

Resting Heart Rate

Heartbeats vs Time (s)

4) A worker has to drive as part of her job. She receives money from her company to pay for gas she uses. See table below:

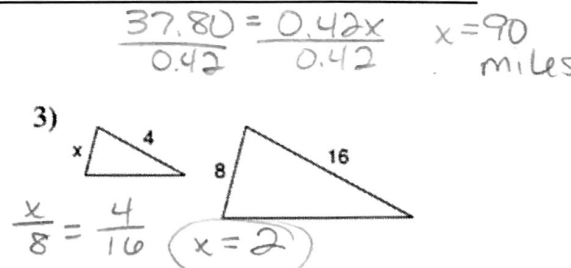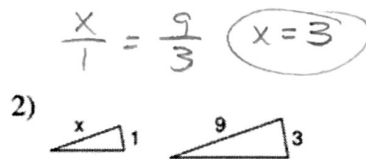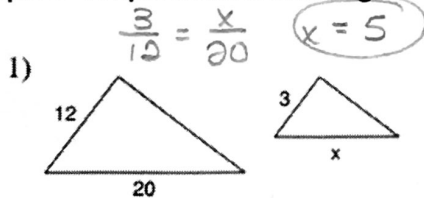| Distance Driven (x miles)	Money Received (y dollars)
20	8.40
35	14.70
45	18.90
50	21.00

A) Find the amount of money the worker receives for any number of work-related miles. Write an equation that can be used to determine the total amount of money, y, the worker receives for driving x work related miles.

$$\frac{8.4}{20} = 0.42 \qquad y = 0.42x$$

B) On Monday, the worker drove 120 total miles (work and personal). If she received $37.80 for the work-related miles, what percent of her total miles were work related on Monday?

$$\frac{90}{120} = \boxed{75\%}$$

$$\frac{37.80}{0.42} = \frac{0.42x}{0.42} \qquad x = 90\ miles$$

Topic 6: Proportional Reasoning

$$\frac{3}{12} = \frac{x}{20} \qquad \boxed{x = 5}$$

1)

12, 20, x

2)

x, 1, 9, 3

$$\frac{x}{1} = \frac{9}{3} \qquad \boxed{x = 3}$$

3)

x, 4, 8, 16

$$\frac{x}{8} = \frac{4}{16} \qquad \boxed{x = 2}$$

4) Complete the table.

5	8
10	16
15	24
20	32
25	40

5) Complete the table.

1	6	15	30	100	200
3	18	45	90	300	600

Topic 8: Converting Unit Rates

1) 5 feet = __60__ inches

2) 13 hours = __780__ minutes

3) 45 kilometers per hour = __750__ meters per minute

4) 3 quarts per second = __45__ gallons per minute

$$\frac{45\ km}{1\ hr} \mid \frac{1000\ m}{1\ km} \mid \frac{1\ hr}{60\ min}$$

$$\frac{3qt}{1\ sec} \mid \frac{1\ gal}{4qt} \mid \frac{60\ sec}{1\ min}$$