

### **UNIT 3: Rates, Ratios and Proportions STUDY GUIDE**

#### **Unit Rate**

<p>1) Four gallons of gasoline cost \$16.80. What is the price per gallon?</p>	<p>2) Which is the best buy?          6 shirts for \$25.50      4 shirts for \$18.00      5 shirts for \$21</p>
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#### **Unit Rate with Complex Fractions**

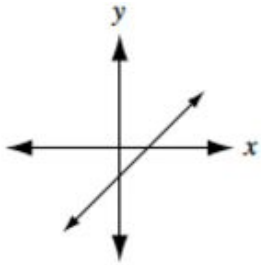
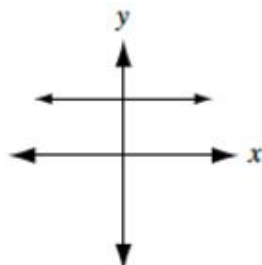
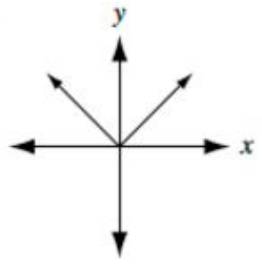
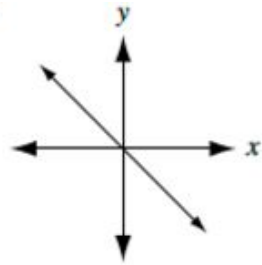
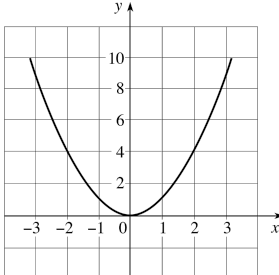
<p>3) Emma drank <math>\frac{1}{4}</math> of a milk shake in <math>\frac{1}{10}</math> of an hour. How many minutes will it take her to drink a full milk shake?</p>	<p>6) Lillian eats <math>\frac{1}{4}</math> of a pound of grapes in <math>\frac{1}{17}</math> of a minute. How many minutes will it take her to eat a full pound of grapes?</p>
<p>4) A bucket of water was <math>\frac{1}{2}</math> full, but it still has <math>2\frac{3}{4}</math> gallons of water in it. How much water would be in one fully filled bucket?</p>	<p>7) Lauren bikes <math>1\frac{1}{3}</math> miles in <math>\frac{1}{10}</math> hour. What is her rate of speed in miles per hour?</p>
<p>5) A recipe calls for using <math>\frac{3}{4}</math> cup of brown sugar for each <math>\frac{2}{3}</math> cup of white sugar. How many cups of brown sugar are used per cup of white sugar?</p>	<p>8) Joey plans to jog 6 miles to the store. He can jog at a constant rate of <math>\frac{1}{2}</math> of a mile every <math>\frac{1}{4}</math> of an hour. How many hours will it take him get to the store?</p>


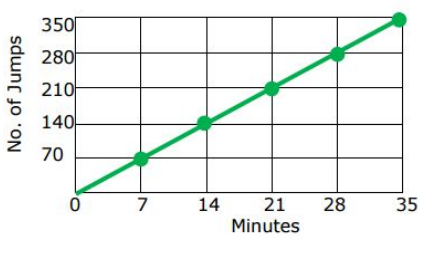
#### **Proportional Relationships from a Graph**

9) List the 3 things a graph must have to show a Proportional Relationship.

1) \_\_\_\_\_ 2) \_\_\_\_\_ 3) \_\_\_\_\_

#### **Does the graph represent a Proportional Relationship? (Circle Proportional or Nonproportional)**

<p>10)</p>  <p style="text-align: center;">Proportional    Non-proportional</p>	<p>11)</p>  <p style="text-align: center;">Proportional    Non-proportional</p>	<p>12)</p>  <p style="text-align: center;">Proportional    Non-proportional</p>	<p>13)</p>  <p style="text-align: center;">Proportional    Non-proportional</p>	<p>14)</p>  <p style="text-align: center;">Proportional    Non-proportional</p>
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<p>15) The graph below represents the number of balls thrown over time. What is the constant of proportionality?</p> 	<p>16) The graph below represents the number of vertical jumps Ava can do over time. How many jumps can she do per minute?</p> 
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**Proportional Relationship from a Table**  
**Do the values represent a Proportional Relationship? (Circle Proportional or NonProportional)**

17) $\frac{7}{14}, \frac{4}{8}$  Proportional      Non-Proportional	18) (0,0) , (3,4) , (6,8) , (9,12)  Proportional      Non-Proportional	19) $\frac{3}{8}, \frac{6}{14}$  Proportional      Non-Proportional
20) $\frac{3}{28}, \frac{6}{56}$  Proportional      Non-Proportional	21) (0,0) , (1,2) , (2,4) , (4,16)  Proportional      Non-Proportional	22) (1,1) , (2,2) , (3,3) , (4,4)  Proportional      Non-Proportional

23) Find the ratio of y to x for Table 1 and Table 2, simplify the fraction to simplest form.

Table 1:

NUMBER OF HOURS	TOTAL COST (\$)	RATIO: $\frac{y}{x}$
1	\$75	
2	\$120	
3	\$165	
4	\$210	
5	\$255	

Table 2:

NUMBER OF HOURS	TOTAL COST (\$)	RATIO: $\frac{y}{x}$
1	\$45	
2	\$90	
3	\$135	
4	\$180	
5	\$225	

b)

a) Which table shows a proportional relationship?

\_\_\_\_\_

What makes it a proportional relationship?

\_\_\_\_\_

24) Isabella made necklaces with beads. If the quantities are proportional, what is the constant of proportionality?

Number of Necklace	2	4	6	8	10
Number of Beads	7	14	21	28	35

25)

Find the constant of proportionality from the table below.

<b>X</b>	1.5	2	3.5	5
<b>Y</b>	10.5	14	24.5	35

26) Write an equation that represents the relationship.

x	y
-2	-7
-4	-14
-6	-21
-8	-28

27) Write an equation to represent the data in the table.

x	y
2	-6.5
5	-16.25
9	-29.25
11	-35.75

28) At a candy store, all the candy is sold by weight. The table below shows the cost to purchase candy by weight.

Weight of Candy (pounds)	Cost (\$)
2	5.12
4	10.24
6	15.36

Write an equation to calculate the cost of pounds of candy, x.

29) The table shows how the number of people who ride a roller coaster depends on the number of cars on the rollercoaster.

Number of Cars	Number of People
3	18
5	30
6	36
8	48

- a) How many people can ride in 1 car? \_\_\_\_\_  
 b) In 10 cars? \_\_\_\_\_

### Answer Key

- 1) \$4.20
- 2) 5 shirts for \$21 (\$4.20)
- 3) 24
- 4)  $16\frac{1}{2}$
- 5)  $1\frac{1}{8}$
- 6)  $\frac{4}{17}$
- 7)  $13\frac{1}{3}$
- 8) 3 hours
- 9) 1) straight line (linear) 2) constant of proportionality 3) goes through origin
- 10) Nonproportional
- 11) nonproportional
- 12) nonproportional
- 13) proportional
- 14) nonproportional
- 15) 5
- 16) 10
- 17) proportional
- 18) proportional
- 19) nonproportional
- 20) proportional
- 21) nonproportional
- 22) proportional
- 23) a) table 2 b) constant rate of change
- 24) 3.5
- 25) 7
- 26)  $y = 3.5x$
- 27)  $y = -3.25x$
- 28)  $y = 2.56x$
- 29) a) 6 b) 60