

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

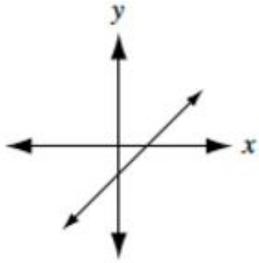
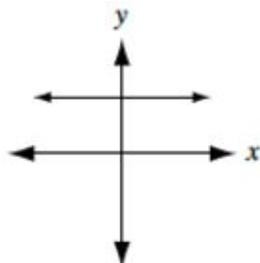
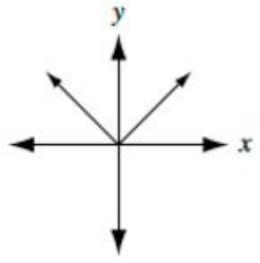
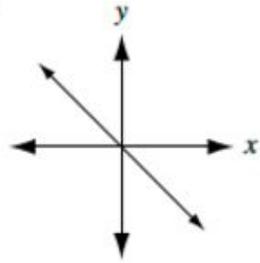
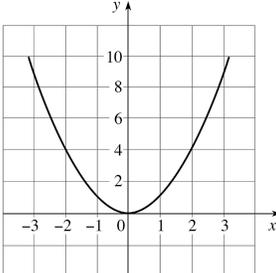
| | |
|--|--|
| <p>3) Emma drank $\frac{1}{4}$ of a milk shake in $\frac{1}{10}$ of an hour. How many minutes will it take her to drink a full milk shake?</p> | <p>6) Lillian eats $\frac{1}{4}$ of a pound of grapes in $\frac{1}{17}$ of a minute. How many minutes will it take her to eat a full pound of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

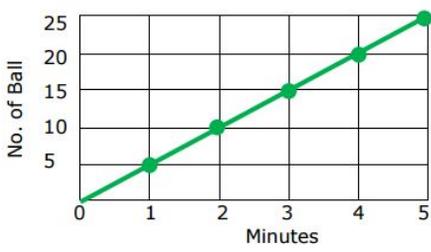
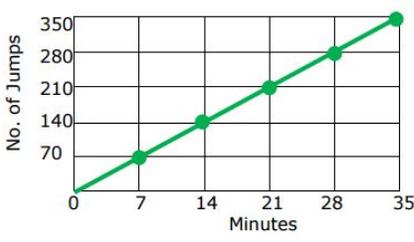
Proportional Relationships from a Graph

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> |
|---|--|--|---|--|

| | |
|---|---|
| <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>  |
|---|---|

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.

| | | | | |
|----------|------|----|------|----|
| X | 1.5 | 2 | 3.5 | 5 |
| Y | 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