

Name _____

Date _____

Mr. Tallman

Lesson #30 - Identifying Proportional Relationships Using Words, Tables and Graphs

Words

In Bubba's nine floor apartment complex, there are a total of 54 apartments. How many apartments per floor are there?

$$\frac{\text{apt.}}{\text{floor}} = \frac{54}{9} = 6 \text{ apartments per floor.}$$

Equation

Use the information from the word problem to write an equation in $y = kx$ form.

$$y = 6x$$

Proportional Relationships

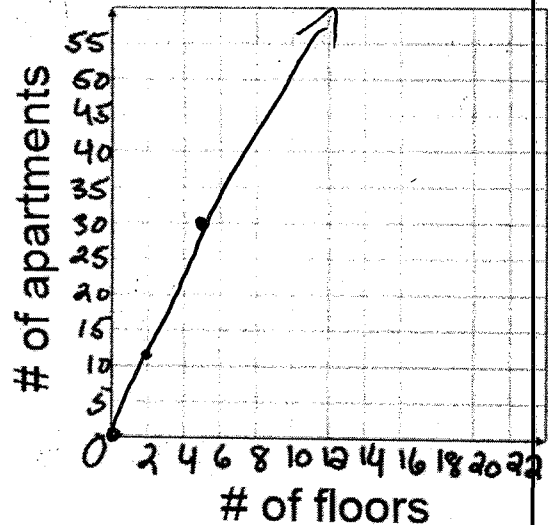
Table

Use the information from the word problem to complete the table.

| | | | | | |
|-----------------|---|----|----|----|----|
| # of floors | 1 | 2 | 5 | 6 | 9 |
| # of apartments | 6 | 12 | 30 | 36 | 54 |

Graph

Use the information from the word problem to complete the graph.



Example 1) A scientist measured the total distance, in feet, that a grasshopper traveled in 3 jumps.

| | | | | | |
|---|------------------|---|-----|---|-----|
| x | Jumps | 0 | 1 | 2 | 3 |
| y | Distance in Feet | 0 | 1.5 | 3 | 4.5 |

Part A) Is the relationship between jumps and feet proportional? Explain why or why not.

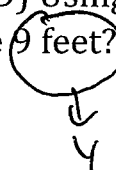
$$\frac{y}{x} \quad \frac{1.5}{1} = 1.5 \quad \frac{3}{2} = \frac{1.5}{1} \quad \frac{4.5}{3} = \frac{1.5}{1}$$

Proportional. All ratios are constant.

Part B) If the relationship is proportional, what is the constant of proportionality? 1.5

Part C) Write an equation to represent the relationship. $y = 1.5x$

Part D) Using the equation from part c, how many jumps will it take for the grasshopper to move 9 feet? Show all work.



$$y = 1.5x$$

$$9 = 1.5x$$

$$\frac{9}{1.5} = \frac{1.5x}{1.5}$$

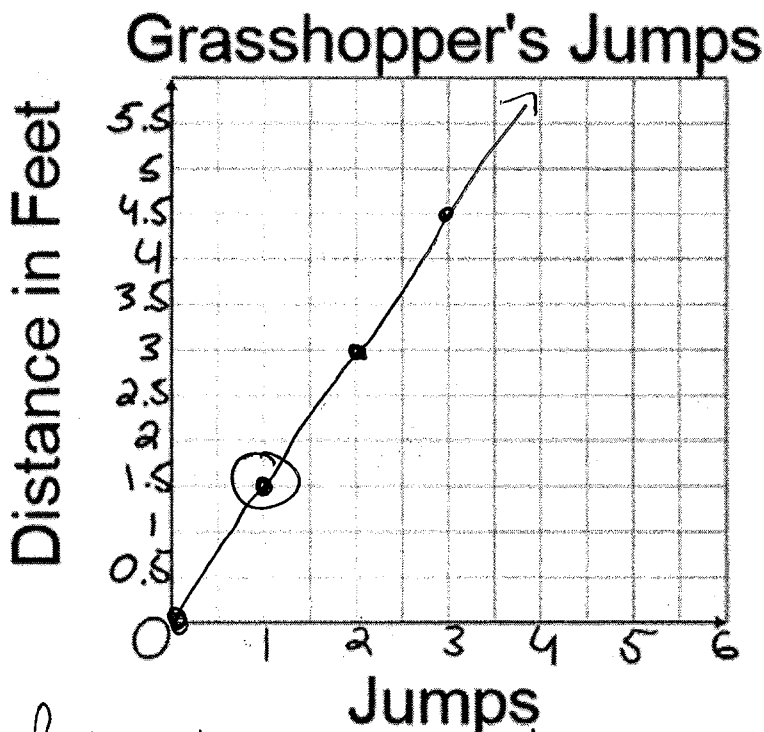
$x = 6$ jumps

Part E) Graph the table of values on the coordinate plane below.

Part F) What are the coordinates of the unit rate? (1, 1.5)

Part G) Explain what the unit rate means in the context of the problem.

A grasshopper jumps 1.5 feet per jump.

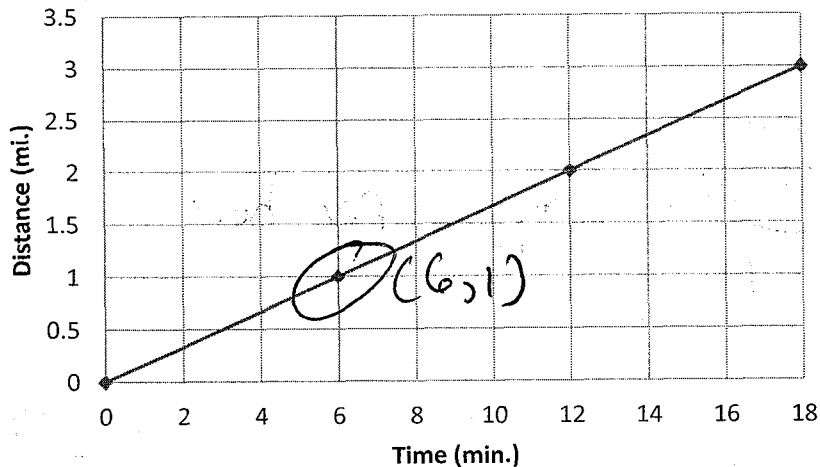


Part H) What does the point (2, 3) represent in the context of the problem?

If the grasshopper jumps 3 feet, it jumped 2 times.

Example 3) A track and field coach wants to give one of his players an award for the athlete who has the greatest rate of speed over a distance. He has narrowed down his choice to two athletes, Danielle and Catherine.

Catherine's speed is shown on the graph below.



Part A) At what rate did Catherine run in miles per minute? Show all work.

$$\frac{y}{x} \quad (6,1) \quad \frac{1}{6} \text{ miles per minute} \\ \times y \quad (0.\overline{16})$$

Part B) Danielle ran 2 miles (y) in 13 minutes (x). What is Danielle's unit rate?

$$\frac{y}{x} \quad \frac{2}{13} \text{ miles per minute} \\ (0.15)$$

Part C) Who should the coach give the award to? Why?

Catherine because she runs at a faster rate.

Example 5) Ryan's earnings per hour from a part time job are shown in the table below.

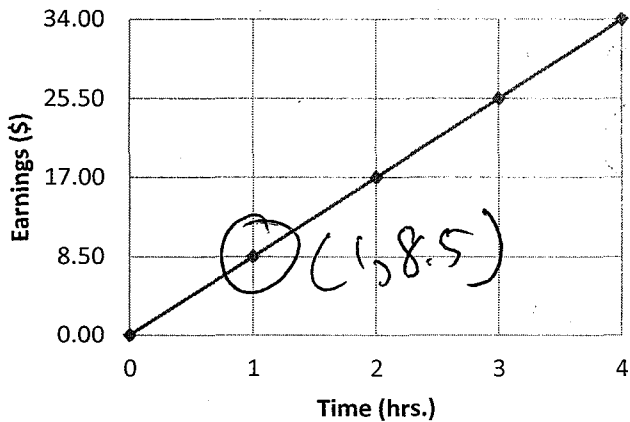
| | | | | |
|-------------------------------|----------------|----------------|-----------------|--------------|
| Time worked (hrs.) (x) | 9 | 12 | 15 | 18 |
| Total Pay (\$) | \$67.50 | \$90.00 | \$112.50 | \$135 |

Part A) What is Ryan's rate of pay (Dollars per hour)? Show all work.

$$\frac{Y}{X} \quad \frac{67.50}{9} = \frac{\$7.50}{1} \quad \$7.50 \text{ per hour.}$$

Part B) What is the equation that represents how Ryan is paid? $Y = 7.5X$

Jason's earnings per hour are represented by the graph below.



Part C) What is Jason's rate of pay (Dollars per hour)?

$$\frac{Y}{X} \quad \frac{(1, 8.5)}{x \quad y} \quad \frac{8.5}{1} \quad \$8.50 \text{ per hour.}$$

Who gets paid more per hour? Why?

Jason gets paid more since he makes \$1 per hour more than Ryan.