

Name: _____ Date: _____ Period: _____

Worksheet 3.R: Building Linearity Review | Chapter 3

Remember:

A direct variation is just a _____ relationship.

To be a direct variation, you need two things:

1. _____
- Same as slope, shows up as looking like a straight line
2. _____
- Shows up on a graph as going through (0,0)

The slope for each direct variation can just be found by putting y over x . So the slope is $\frac{y}{x}$.

The equation for each direct variation will always be in the form $y=mx$.

The only thing that will change is m , which is the slope.

A. For Exercises 1–3, determine whether each linear function is a direct variation. If so, state the constant of variation.

1.

| | | | | |
|-----------------------|-----|-----|-----|-----|
| Hours, x | 11 | 12 | 13 | 14 |
| Distance, y (miles) | 154 | 167 | 180 | 193 |

2.

| | | | | |
|------------|---|---|----|----|
| Age, x | 8 | 9 | 10 | 11 |
| Grade, y | 3 | 4 | 5 | 6 |

B. For Exercises 4–12, y varies directly with x . Write an equation for the direct variation. Then find each value.

1. If $y = 8$ when $x = 3$, find y when $x = 45$.

2. If $y = -4$ when $x = 10$, find y when $x = 2$.

3. If $y = 27$ when $x = 8$, find y when $x = 11$.

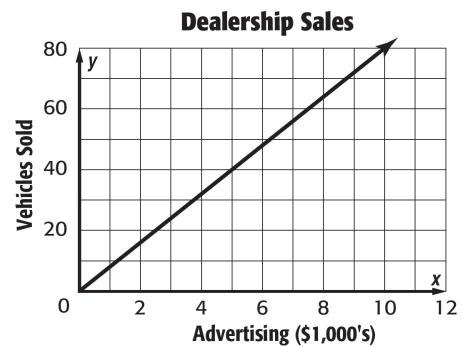
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C. Steps to make and use a direct variation equation:

For each of the following, write a direct variation equation to help you solve.

1. The number of vehicles a dealership sells varies directly with the money spent on advertising. How many vehicles does the dealership sell for each \$1,000 spent on advertising?



2. Bruce rents snowmobiles to tourists. He charges \$135 for 4 hours and \$202.50 for 6 hours. What is the hourly rate Bruce charges to rent a snowmobile?

3. Ms. Adams hikes 40 miles for every 1.25 gallons in her camelback. What is (a) the rate of miles per gallon and (b) the distance Ms. Adams hiked in the Narrows if she had 10 gallons in her camelback?

a)

b)

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Use unit rates to help you solve the following situation.

1. A brownie recipe calls for $\frac{1}{2}$ cup of vegetable oil to make 12 servings. How much vegetable oil is required to make 18 servings?

Use the table below.

2. Is this relationship linear? If so, find the constant rate of change? If not, explain.

| | | | | |
|------------------------|----|----|----|----|
| Time (hours), x | 0 | 4 | 6 | 8 |
| Fees (\$), y | 10 | 18 | 22 | 26 |

Write a direct variation equation below, and then find the missing value.

3. If $y = -5$ when $x = -20$, what is the value of x when $y = 8$?

Write a direct variation equation below, and then find the missing value.

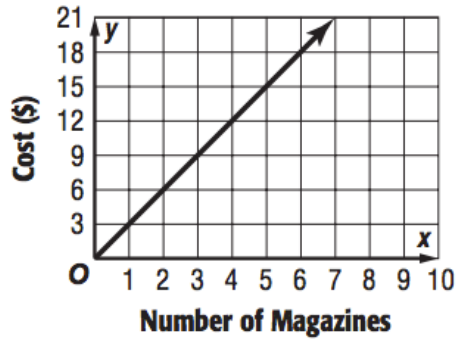
4. Find y when $x = 1$, if $y = 2$ when $x = -\frac{2}{3}$.

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Find the slope of the following graphs, and interpret the constant rate of change.

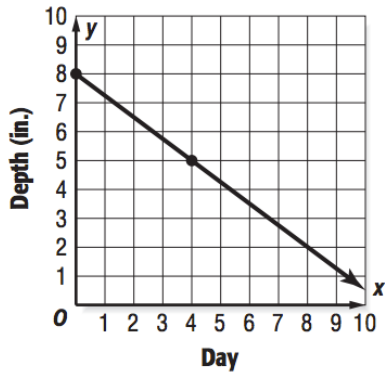
5.



Find the slope of the following graph, and interpret the rate of change.

Depth of Water in Vase

6.



Find the slope of the line that passes through the pairs of points given.

5. (-2, 5) and (1, -7)

6. (7, 4) and (-3, -3)

7. (3, 3) and (-7, -4)