Name _____ Date _____ Class _____

LESSON 12-5

# Practice A

## *Direct Variation*

**The following tables show direct variation for the given equation. Complete the missing information in the tables.**

**1.** $y = 2x$

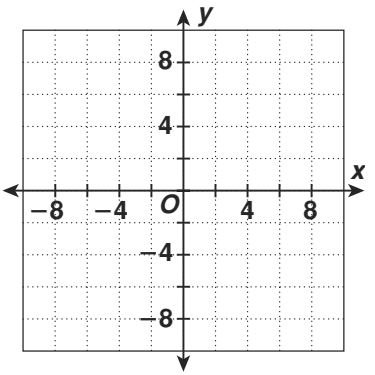
| ***x*** | −10 | −7 | | 3 | | | 15 | 22 |
|---|---|---|---|---|---|---|---|---|
| ***y*** | | | −8 | | 12 | 24 | | |

**2.** $y = \frac{1}{3}x$

| ***x*** | −21 | | −9 | 3 | 8 | | 19 | |
|---|---|---|---|---|---|---|---|---|
| ***y*** | | −5 | | | | 4 | | 10 |

**3.** Make a graph to determine whether the data sets show direct variation.

| ***x*** | ***y*** |
|---|---|
| −8 | −4 |
| −6 | −3 |
| 0 | 0 |
| 2 | 1 |
| 4 | 2 |
| 6 | 3 |




_____

**Find each equation of direct variation, given that *y* varies directly with *x*.**

**4.** *y* is 10 when *x* is 2.

_____

**5.** *y* is 42 when *x* is −6.

_____

**6.** *y* is −50 when *x* is 5.

_____

**7.** *y* is 15 when *x* is 30.

_____

**8.** At a constant speed, the gasoline a car uses varies directly with the distance the car travels. A car uses 10 gallons of gasoline to travel 210 miles. How many gallons will the car use to travel 294 miles? _____

LESSON 12-4

## Problem Solving

### *Point-Slope Form*

**Write the correct answer.**

1. A 1600 square foot home in Houston will sell for about $102,000. The price increases about $43.41 per square foot. Write an equation that describes the price $y$ of a house in Houston, based on the square footage $x$.

   $y - 102{,}000 = 43.41(x - 1600)$

2. Write the equation in Exercise 1 in slope-intercept form.

   $y = 43.41x + 32{,}544$

3. Wind chill is a measure of what temperature feels like with the wind. With a 25 mph wind, 40°F will feel like 29°F. Write an equation in point-slope form that describes the wind chill $y$ based on the temperature $x$, if the slope of the line is 1.337.

   $y - 29 = 1.337(x - 40)$

4. With a 25 mph wind, what does a temperature of 0°F feel like?

   −24.48°F

**From 2 to 13 years, the growth rate for children is generally linear. Choose the letter of the correct answer.**

5. The average height of a 2-year old boy is 36 inches, and the average growth rate per year is 2.2 inches. Write an equation in point-slope form that describes the height of a boy $y$ based on his age $x$.
   - **A** $y - 36 = 2(x - 2.2)$
   - **B** $y - 2 = 2.2(x - 36)$
   - **C** $y - 36 = 2.2(x - 2)$
   - **D** $y - 2.2 = 2(x - 36)$

6. The average height of a 5-year old girl is 44 inches, and the average growth rate per year is 2.4 inches. Write an equation in point-slope form that describes the height of a girl $y$ based on her age $x$.
   - **F** $y - 2.4 = 44(x - 5)$
   - **G** $y - 44 = 2.4(x - 5)$
   - **H** $y - 44 = 5(x - 2.4)$
   - **J** $y - 5 = 2.4(x - 44)$

7. Write the equation from Exercise 6 in slope-intercept form.
   - **A** $y = 2.4x - 100.6$
   - **B** $y = 44x - 217.6$
   - **C** $y = 5x + 32$
   - **D** $y = 2.4x + 32$

8. Use the equation in Exercise 6 to find the average height of a 13-year old girl.
   - **F** 56.3 in.
   - **G** 63.2 in.
   - **H** 69.4 in.
   - **J** 97 in.

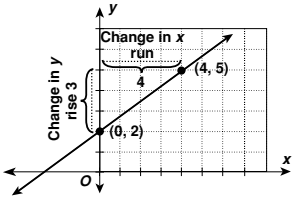



LESSON 12-4

## Reading Strategies

### *Use a Procedure*

To find the slope of a line, you can use the coordinates for two points on the line.




**Step 1:** Subtract to find the difference between the $y$-coordinates of the two points: $5 - 2 = 3$.

**Step 2:** Subtract to find the difference between the $x$-coordinates of the two points: $4 - 0 = 4$.

**Step 3:** Write the ratio of the differences. The difference between the $y$-coordinates is 3. The difference between the $x$-coordinates is 4. The slope is the ratio $\frac{3}{4}$.

When you have the slope of a line and a point it passes through, you can write an equation for the line in **point-slope form.**

| Point on the line | Slope | Point-slope form |
|---|---|---|
| $(x_1, y_1)$ | $m$ | $y - y_1 = m(x - x_1)$ |
| (4, 5) | $\frac{3}{4}$ | $y - 5 = \frac{3}{4}(x - 4)$ |

**Use the above example to answer each question.**

1. What ratio is shown by the slope of a line?

   $\frac{\text{change in } y}{\text{change in } x}$, or $\frac{\text{rise}}{\text{run}}$

2. How can you find the slope of a line?

   Possible answer: Find the difference between the $y$-values of two points and find the difference between the $x$-values of the same points; write the differences as a ratio.

3. What information do you need to write an equation for a line in point-slope form?

   coordinates of a point the line passes through and slope of the line




LESSON 12-4

## Puzzles, Twisters & Teasers

### *Get a Clue!*

**Identify a point on each line and the slope of the line. Then use the slope values to answer the riddle.**

| | | | |
|---|---|---|---|
| 1. $y + 1 = \frac{2}{3}(x + 7)$ | point = $-7, -1$ | slope = $\frac{2}{3}$ | S |
| 2. $y + 1 = 11(x - 1)$ | point = $1, -1$ | slope = $11$ | C |
| 3. $y - 2 = -\frac{1}{6}(x - 11)$ | point = $11, 2$ | slope = $-\frac{1}{6}$ | N |
| 4. $y + 7 = 1(x - 5)$ | point = $5, -7$ | slope = $1$ | L |
| 5. $y + 7 = 3(x + 4)$ | point = $-4, -7$ | slope = $3$ | E |
| 6. $y - 9 = 5(x - 12)$ | point = $12, 9$ | slope = $5$ | B |
| 7. $y - 11 = 14(x - 8)$ | point = $8, 11$ | slope = $14$ | H |
| 8. $y - 4 = -2(x + 7)$ | point = $-7, 4$ | slope = $-2$ | O |
| 9. $y - 3 = -1.8(x - 5.6)$ | point = $5.6, 3$ | slope = $-1.8$ | R |
| 10. $y + 8 = -6(x - 9)$ | point = $9, -8$ | slope = $-6$ | K |

**What do you call a dog detective?**

| S | H | E | R | L | O | C | K |
|---|---|---|---|---|---|---|---|
| $\frac{2}{3}$ | 14 | 3 | −1.8 | 1 | −2 | 11 | −6 |

| B | O | N | E | S |
|---|---|---|---|---|
| 5 | −2 | $-\frac{1}{6}$ | 3 | $\frac{2}{3}$ |




LESSON 12-5

## Practice A

### *Direct Variation*

**The following tables show direct variation for the given equation. Complete the missing information in the tables.**

1. $y = 2x$

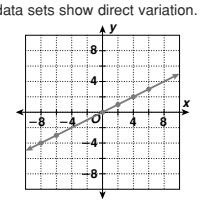
| $x$ | −10 | −7 | −4 | 3 | 6 | 12 | 15 | 22 |
|---|---|---|---|---|---|---|---|---|
| $y$ | −20 | −14 | −8 | 6 | 12 | 24 | 30 | 44 |

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

| $x$ | −21 | −15 | −9 | 3 | 8 | 12 | 19 | 30 |
|---|---|---|---|---|---|---|---|---|
| $y$ | −7 | −5 | −3 | 1 | $2\frac{2}{3}$ | 4 | $6\frac{1}{3}$ | 10 |

3. Make a graph to determine whether the data sets show direct variation.

| $x$ | $y$ |
|---|---|
| −8 | −4 |
| −6 | −3 |
| 0 | 0 |
| 2 | 1 |
| 4 | 2 |
| 6 | 3 |




The data sets show direct variation.

**Find each equation of direct variation, given that $y$ varies directly with $x$.**

4. $y$ is 10 when $x$ is 2.

   $y = 5x$

5. $y$ is 42 when $x$ is −6.

   $y = -7x$

6. $y$ is −50 when $x$ is 5.

   $y = -10x$

7. $y$ is 15 when $x$ is 30.

   $y = \frac{1}{2}x$

8. At a constant speed, the gasoline a car uses varies directly with the distance the car travels. A car uses 10 gallons of gasoline to travel 210 miles. How many gallons will the car use to travel 294 miles? 14 gallons