NAME _____ DATE _____ PERIOD _____

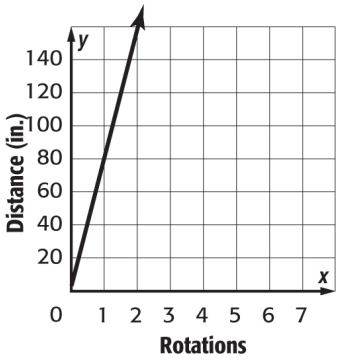
# Lesson 3 Reteach

## *Equations in y = mx Form*

When the ratio of two variable quantities is constant, their relationship is called a **direct variation**.

### Example 1

**The distance that a bicycle travels varies directly with the number of rotations that its tires make. Determine the distance that the bicycle travels for each rotation.**




Since the graph of the data forms a line, the rate of change is constant. Use the graph to find the constant ratio.

$\frac{\text{distance traveled}}{\text{\# of rotations}} \longrightarrow \frac{80}{1} \quad \frac{160}{2}$ or $\frac{80}{1} \quad \frac{240}{3}$ or $\frac{80}{1} \quad \frac{320}{4}$ or $\frac{80}{1}$

The bicycle travels 80 inches for each rotation of the tires.

### Example 2

**The number of trading cards varies directly as the number of packages. If there are 84 cards in 7 packages, how many cards are in 12 packages?**

Let $x$ = the number of packages and $y$ = the total number of cards.

| | |
|---|---|
| $y = mx$ | Direct variation equation |
| $84 = m(7)$ | $y = 84$, $x = 7$ |
| $12 = m$ | Simplify. |
| $y = 12x$ | Substitute for $m = 12$. |

Use the equation to find $y$ when $x = 12$.

$y = 12x$

$y = 12(12)$ $x = 12$

$y = 144$ Multiply.

There are 144 cards in 12 packages.

### Exercises

**Write an equation and solve the given situation.**

1. **TICKETS** Four friends bought movie tickets for $41. The next day seven friends bought movie tickets for $71.75. What is the price of one ticket?

2. **JOBS** Barney earns $24.75 in three hours. If the amount that he earns varies directly with the number of hours, how much would he earn in 20 hours?

NAME _____ DATE _____ PERIOD _____

# Lesson 3 Skills Practice

## *Equations in y = mx Form*

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

**1.**

| **Price, *x*** | $5 | $10 | $15 | $20 |
|---|---|---|---|---|
| **Tax, *y*** | $0.41 | $0.82 | $1.23 | $1.64 |

**2.**

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

**3.**

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

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

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

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

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

**7.** Find $y$ when $x = 12$, if $y = 2$ when $x = 5$.

**8.** Find $y$ when $x = 3$, if $y = -4$ when $x = -9$.

**9.** Find $y$ when $x = -6$, if $y = 15$ when $x = -5$.

**10.** If $y = 20$ when $x = 8$, what is the value of $x$ when $y = -2$?

**11.** If $y = -30$ when $x = 15$, what is the value of $x$ when $y = 60$?

**12.** If $y = 42$ when $x = 15$, what is the value of $x$ when $y = 70$?

NAME _____ DATE _____ PERIOD _____

# Lesson 4 Reteach

## *Slope-Intercept Form*

Linear equations are often written in the form $y = mx + b$. This is called the **slope-intercept form**. When an equation is written in this form, $m$ is the slope and $b$ is the $y$-intercept.

**Example 1**

**State the slope and the $y$-intercept of the graph of $y = x - 3$.**

$y = x - 3$ Write the original equation.

$y = 1x + (-3)$ Write the equation in the form $y = mx + b$.

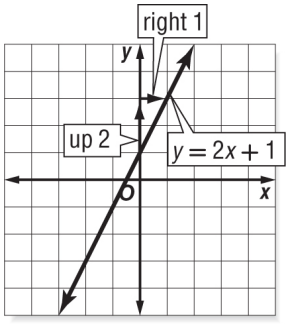
$y = mx + b$ $m = 1$, $b = -3$

The slope of the graph is 1, and the $y$-intercept is –3.

You can use the slope intercept form of an equation to graph the equation.

**Example 2**

**Graph $y = 2x + 1$ using the slope and $y$-intercept.**




**Step 1** Find the slope and $y$-intercept.

$y = 2x + 1$ slope = 2, $y$-intercept = 1

**Step 2** Graph the $y$-intercept 1.

**Step 3** Write the slope 2 as $\frac{2}{1}$. Use it to locate a second point on the line.

$m = \frac{2}{1}$ ← change in $y$ : up 2 units
← change in $x$ : right 1 unit

**Step 4** Draw a line through the two points.

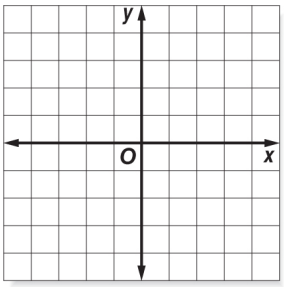
**Exercises**

**State the slope and the $y$-intercept for the graph of each equation.**

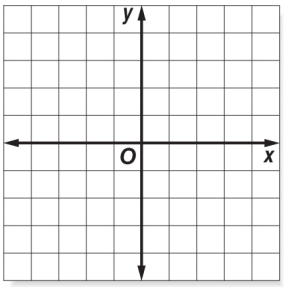
**1.** $y = x + 1$ **2.** $y = 2x - 4$ **3.** $y = \frac{1}{2}x - 1$

**Graph each equation using the slope and the $y$-intercept.**

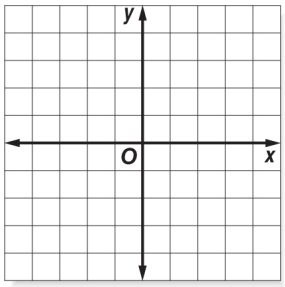
**4.** $y = 2x + 2$




**5.** $y = x - 1$




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



NAME _____ DATE _____ PERIOD _____

# Lesson 4 Skills Practice

## *Slope-Intercept Form*

**State the slope and the *y*-intercept for the graph of each equation.**

**1.** $y = x + 4$

**2.** $y = 2x - 2$

**3.** $y = 3x - 1$

**4.** $y = -x + 3$

**5.** $y = \frac{1}{2}x - 5$

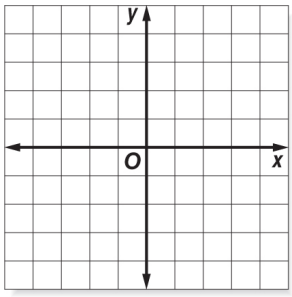
**6.** $y = -\frac{1}{3}x + 4$

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

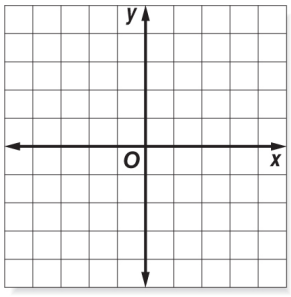
**8.** $y + 4x = 2$

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

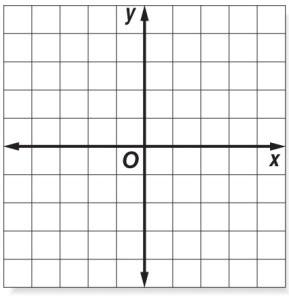
**10.** Graph a line with a slope of 1 and a *y*-intercept of –4.




**11.** Graph a line with a slope of 2 and a *y*-intercept of –3.

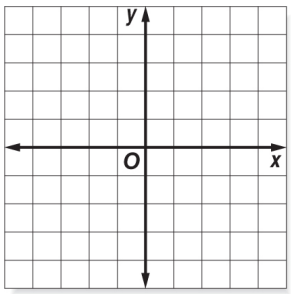



**12.** Graph a line with a slope of $\frac{1}{3}$ and a *y*-intercept of 1.

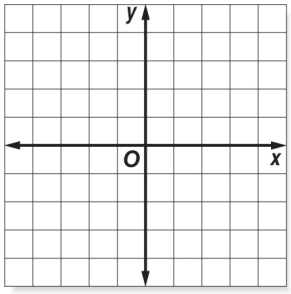



**Graph each equation using the slope and the *y*-intercept.**

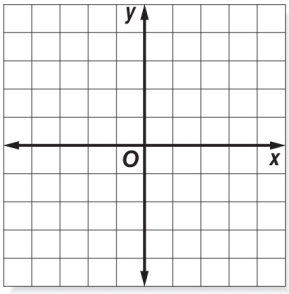
**13.** $y = 3x - 3$



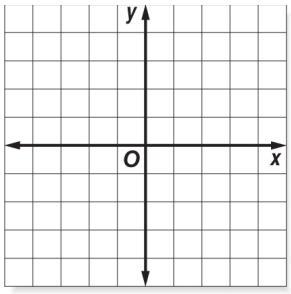

**14.** $y = -x + 1$



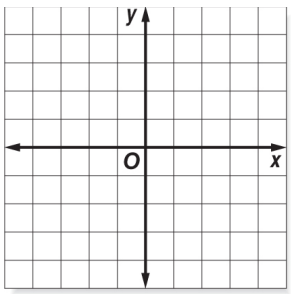

**15.** $y = \frac{1}{2}x - 2$




**16.** $y = 4x - 2$




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




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