Study Guide and Intervention

Alg1 6.0

Graphing Equations in Slope-Intercept Form

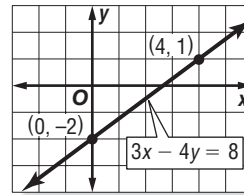## Slope-Intercept Form

Slope-Intercept Form	$y = mx + b$, where m is the given slope and b is the y-intercept

Example 1 **Write an equation of the line whose slope is −4 and whose *y*-intercept is 3.**

$y = mx + b$ Slope-intercept form
$y = -4x + 3$ Replace m with −4 and b with 3.

Example 2 **Graph $3x - 4y = 8$.**

$3x - 4y = 8$ Original equation
$-4y = -3x + 8$ Subtract 3x from each side.
$\dfrac{-4y}{-4} = \dfrac{-3x + 8}{-4}$ Divide each side by −4.
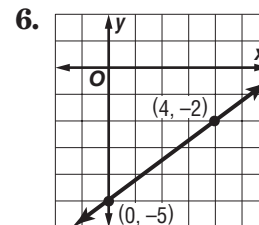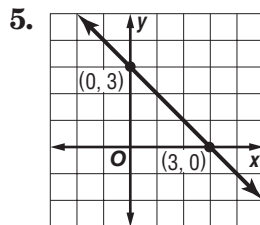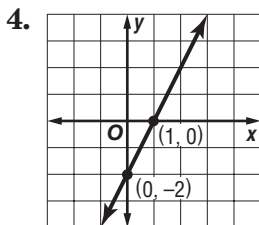$y = \dfrac{3}{4}x - 2$ Simplify.

The y-intercept of $y = \dfrac{3}{4}x - 2$ is −2 and the slope is $\dfrac{3}{4}$. So graph the point $(0, -2)$. From this point, move up 3 units and right 4 units. Draw a line passing through both points.
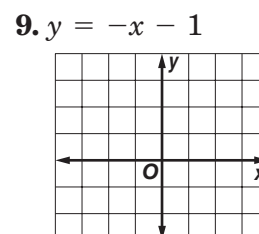
Exercises

Write an equation of the line with the given slope and *y*-intercept.

1. slope: 8, y-intercept −3   **2.** slope: −2, y-intercept −1   **3.** slope: −1, y-intercept −7

Write an equation of the line shown in each graph.

4.

5.

6.

Graph each equation.

7. $y = 2x + 1$ **8.** $y = -3x + 2$ **9.** $y = -x - 1$
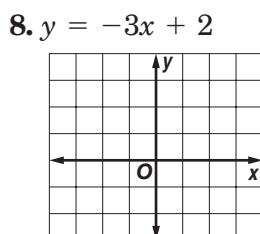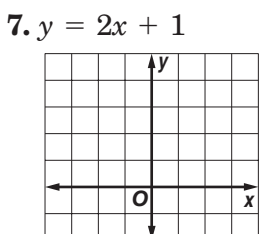
Study Guide and Intervention   *(continued)*

Graphing Equations in Slope-Intercept Form

Model Real-World Data

Example   **MEDIA** Since 1999, the number of music cassettes sold has decreased by an average rate of 27 million per year. There were 124 million music cassettes sold in 1999.

a. Write a linear equation to find the average number of music cassettes sold in any year after 1999.

The rate of change is -27 million per year. In the first year, the number of music cassettes sold was 124 million. Let N = the number of millions of music cassettes sold. Let x = the number of years after 1999. An equation is $N = -27x + 124$.

b. Graph the equation.

The graph of $N = -27x + 124$ is a line that passes through the point at $(0, 124)$ and has a slope of -27.

c. Find the approximate number of music cassettes sold in 2003.

$N = -27x + 124$	Original equation
$N = -27(4) + 124$	Replace x with 3.
$N = 16$	Simplify.

There were about 16 million music cassettes sold in 2003.

Music Cassettes Sold

Number of Cassettes
125, 100, 75, 50, 25
Years Since 1999
0 1 2 3 4 5 6 7
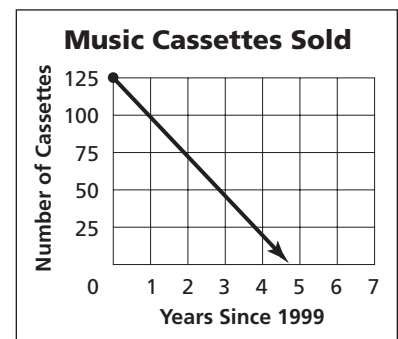
Source: *The World Almanac*

Exercises

MUSIC In 1999, Rap and Hip-Hop music represented 9.7% of total music sales. Beween 1999 and 2003, the percent increased by about 0.7% per year.

1. Write an equation to find the percent P of recorded music and music videos sold that was Rap and Hip-Hop music for any year x between 1999 and 2003.

2. Graph the equation on the grid at the right.

3. Find the percent of recorded music and music videos sold that was Rap and Hip-Hop music in 2001.

Rap/Hip-Hop Music Sales

Percent of Total Music Sales
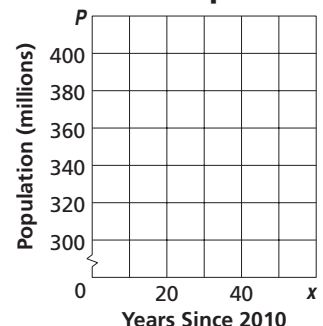14, 13, 12, 11, 10, 9
Years Since 1999
1 2 3 4 5
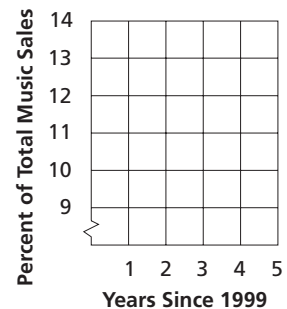
Source: *The World Almanac*

POPULATION The population of the United States is projected to be 300 million by the year 2010. Between 2010 and 2050, the population is expected to increase by about 2.5 million per year.

4. Write an equation to find the population P in any year x between 2010 and 2050.

5. Graph the equation on the grid at the right.

6. Find the population in 2050.

Projected United States Population

P
Population (millions)
400, 380, 360, 340, 320, 300
Years Since 2010
0 20 40 x

Source: *The World Almanac*