



NAME _____ DATE _____

Writing Linear Equations in Slope-Intercept Form (Pages 346–353)

The coordinates at which a graph intersects the axes are known as the **x-intercept** and the **y-intercept**.

Finding Intercepts	To find the x-intercept, substitute 0 for y in the equation and solve for x. To find the y-intercept, substitute 0 for x in the equation and solve for y.
Slope-Intercept Form of a Linear Equation	If a line has a slope of m and a y-intercept of b , then the slope-intercept form of an equation of the line is $y = mx + b$.

EXAMPLE

Find the x- and y-intercepts of the graph of $2x + 3y = 5$. Then, write the equation in slope-intercept form.

$$2x + 3(0) = 5 \quad \text{Let } y = 0.$$

$$2x = 5$$

$$x = 1 \quad \text{The x-intercept is 1.}$$

$$2(0) + 3y = 5 \quad \text{Let } x = 0.$$

$$3y = 5$$

$$y = \frac{5}{3} \quad \text{The y-intercept is } \frac{5}{3}.$$

Slope-Intercept Form: $2x + 3y = 5$

$$3y = -2x + 5 \quad \text{Subtract } 2x \text{ from each side.}$$

$$y = -\frac{2}{3}x + \frac{5}{3} \quad \text{Divide each side by 3.}$$

Note that in this form we can see that the slope m of the line is $-\frac{2}{3}$, and the y-intercept b is $\frac{5}{3}$.

PRACTICE

Find the x- and y-intercepts of the graph of each equation.

1. $6x + 2y = 10$

2. $6x - y = -7$

3. $8y - 5 = 3x$

Write an equation in slope-intercept form of a line with the given slope and y-intercept. Then write the equation in standard form.

4. $m = 5, b = 5$

5. $m = 2, b = -7$

6. $m = -3, b = 0$

Find the slope and y-intercept of the graph of each equation.

7. $7y = x - 10$

8. $8x - \frac{1}{2}y = -2$

9. $4(x - 5y) = 9(x + 1)$

10. **Chemistry** The graph of an equation to convert degrees Celsius, x , to degrees Fahrenheit, y , has a y-intercept of 32° . Given that water boils at 212°F and at 100°C , write the conversion equation.



11. **Standardized Test Practice** What is the slope-intercept form of an equation for the line that passes through $(0, 1)$ and $(3, 37)$?

A $y = 12x - 1$

B $y = 12x + 1$

C $y = -12x - 1$

D $y = -12x + 1$

Answers: 1. $\frac{5}{3}, 5$ 2. $-\frac{6}{7}, 7$ 3. $-\frac{3}{5}, \frac{8}{5}$ 4. $y = 5x + 5, 5x + 5, 5x - y = -5$ 5. $y = 2x - 7, 2x - y = 7$ 6. $y = -3x + 3, 3x + y = 0$ 7. $\frac{7}{1}, -\frac{1}{10}$ 8. $16, 4$ 9. $-\frac{4}{1}, -\frac{20}{9}$ 10. $y = \frac{5}{8}x + 32$ 11. B
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