

# Algebra I

## Lesson 4-5

- I can determine whether an equation is linear.
- I can graph linear equations.

A linear equation is the equation of a line. It can often be written in the form  $Ax + By = C$ . This is called the standard form of a linear equation.

$$Ax + By = C$$

$A \geq 0$ ,  $A$  and  $B$  are not both  $0$

$A, B, C$  are integers with  $GCF = 1$

Determine whether each equation is a linear equation. If so, write the equation in standard form.

$$y = 5 - 2x$$

$$\begin{array}{r} +2x \quad +2x \\ \hline 2x + y = 5 \end{array}$$

(yes)

$$2xy - 5y = 6$$

(No)

$$\frac{3x + 9y}{3} = \frac{15}{3}$$

$$x + 3y = 5$$

(yes)

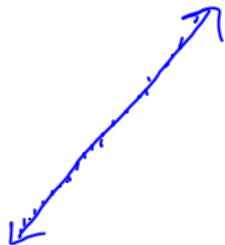
$$3 \cdot \frac{1}{3}y = -1 \cdot 3$$

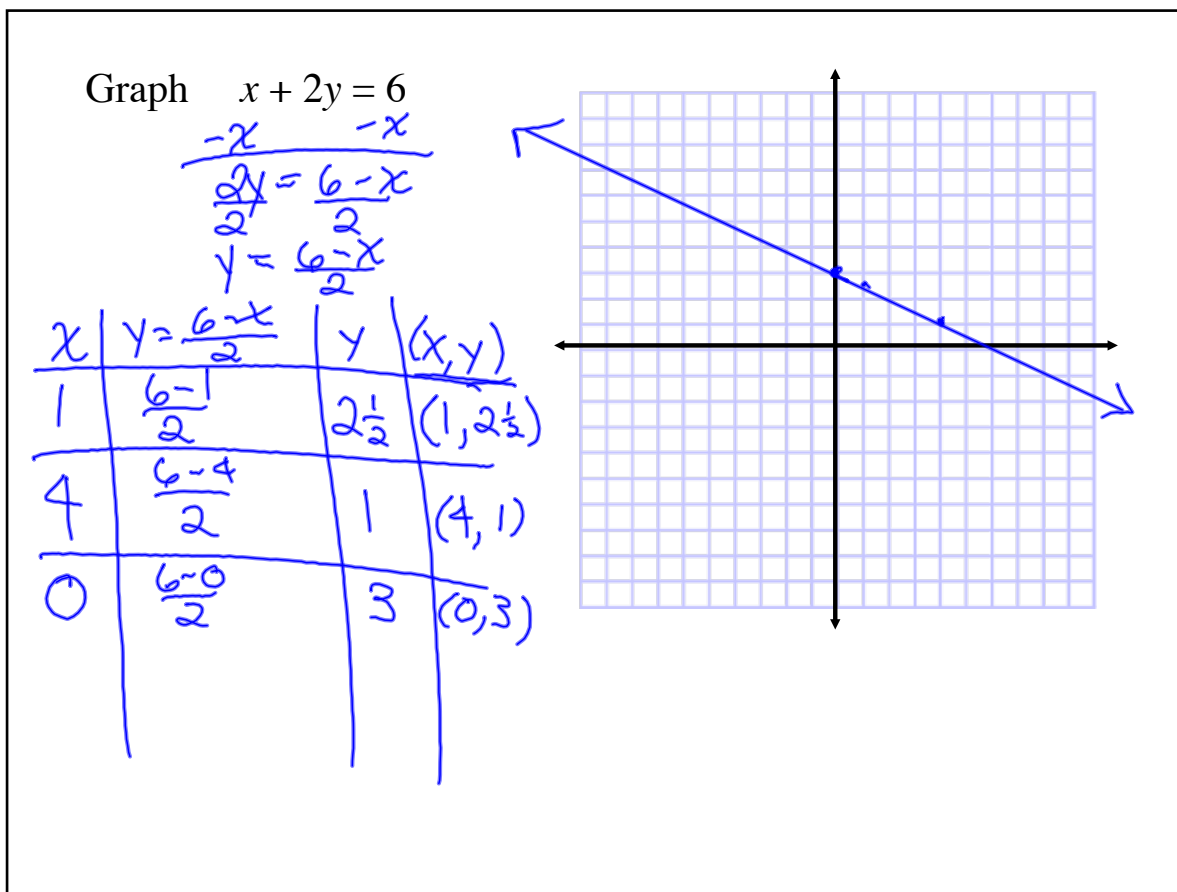
$$y = -3$$

$$0x + y = -3$$

(yes)

The graph of a linear equation is a continuous line. It extends beyond the endpoints in each direction and represents all the solutions of the linear equation. Every ordered pair on this line satisfies the equation.

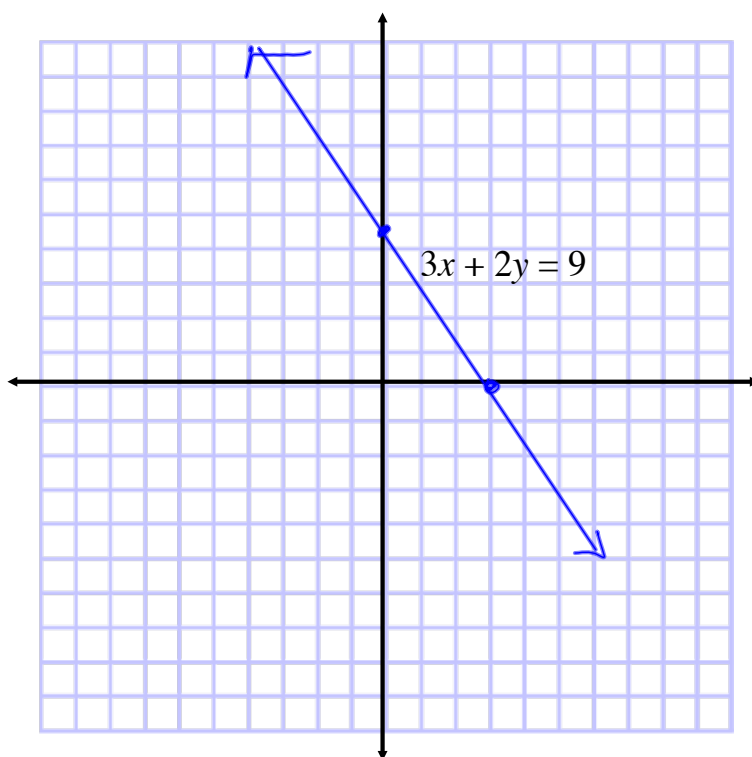




Since two points determine a line, a simple method of graphing a linear equation is to find the points where the graph crosses the x-axis and the y-axis. The x-coordinate of the point at which the graph crosses the x-axis is the x-intercept, and the y-coordinate of the point at which the graph crosses the y-axis is called the y-intercept.

Determine the  $x$ -intercept and  $y$ -intercept of  $3x + 2y = 9$ . Then graph the equation.

$$3x + 2y = 9$$
$$3x + 2(0) = 9$$
$$\frac{3x}{3} = \frac{9}{3}$$
$$x = 3$$
$$(3, 0)$$
$$3(0) + 2y = 9$$
$$\frac{2y}{2} = \frac{9}{2}$$
$$y = 4\frac{1}{2}$$
$$(0, 4\frac{1}{2})$$



# Assignment

Due Friday

Pgs. 221-222 #16-44 even