3.4 Slope-Intercept Form of a Line

Learning Objectives:

1. Use the slope-intercept form to identify the slope and *y*-intercept of a line.
2. Graph a line whose equation is in slope-intercept form.
3. Graph a line whose equation is in the form *Ax + By = C*.
4. Find the equation of a line given its slope and *y*-intercept.
5. Work with linear models in slope-intercept form.

1. Use the slope-intercept form to identify the slope and *y*-intercept of a line

Slope-intercept Form-is an equation of the form $y = mx + b$ where _____ is the slope and _____is the y-intercept**.**

Steps of Finding a Slope and the y-intercept from the given Equation:

1. Write the given equation in the form _____**.**
2. Identify the slope and y-intercept.

Example 1. Find the slope and the y-intercept of the following equations.

1. $y = -\frac{5}{9}x + 3$

2. $y = -12$

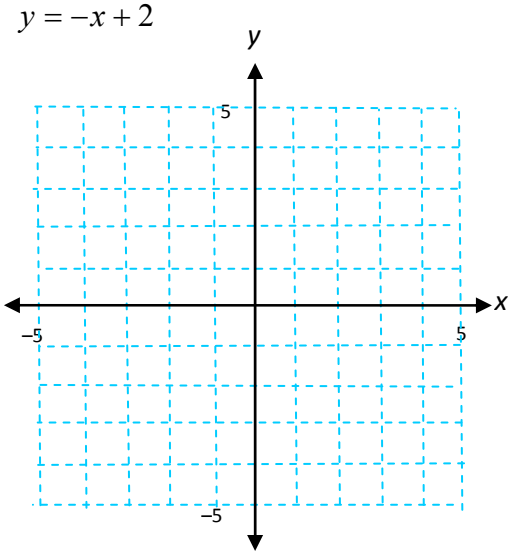
4. $x = 9$

2. $2x + 3y = 6$

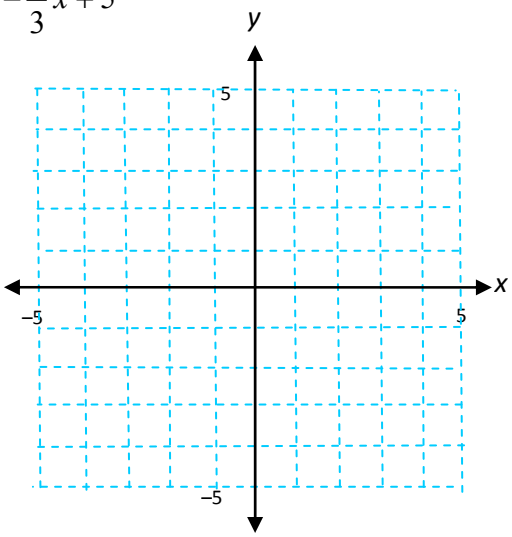
2. <u>Graph a line whose equation is in slope-intercept form</u>

<u>Example 2</u>. Use the slope and *y*-intercept to graph each line whose equation is given. Label at least two points on the graph grid.

1. $y = -x + 2$



2. $y = -\frac{2}{3}x + 5$

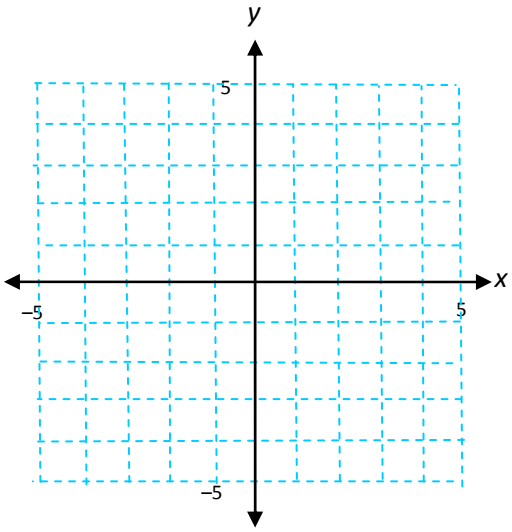


3. <u>Graph a line whose equation is in the form *Ax + By = C*</u>

<u>Steps to graph the equation of the form *Ax + By = C*</u>

1. Write the given equation in the form _____.
2. Identify the slope and y-intercept.

<u>Example 3</u>. Graph $2x - 5y = 10$. Label at least two points on the graph grid.



4. Find the equation of a line given its slope and *y*-intercept

Example 4. Find the equation of the line with the given slope and intercept.

1. Slope is $-\frac{3}{4}$; *y*-intercept is 6

2. Slope is undefined; *x*-intercept is −2

3. $m = 0$; y-intercept is 3

5. Work with linear models in slope-intercept form

Example 5. Cost Equations

Suppose the variable cost of manufacturing a graphing calculator is $10 per calculator while the daily fixed cost is $200.

1. Write a linear equation that related cost *y* to the number of calculators manufactured *x*.

2. What is the daily cost of manufacturing 500 calculators?

3. One day, the total cost was $1900. How many calculators were manufactured?

4. Graph the equation relating cost and number of calculator manufactured.