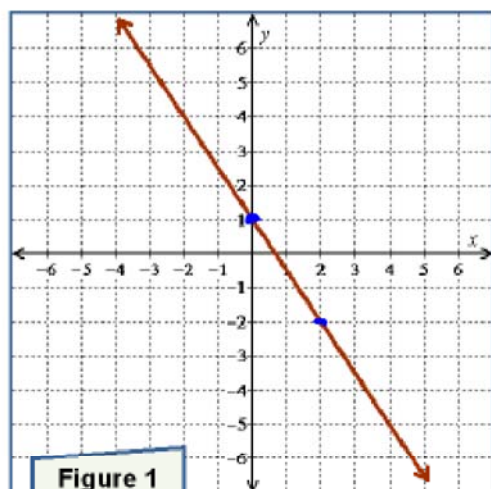


### Example 1

The line  $3x + 2y = 2$  is shown in Figure 1.

- Find two points on the line and verify that they in fact satisfy the equation  $3x + 2y = 2$ .
- Find the slope and y-intercept of the line.
- Solve the equation  $3x + 2y = 2$  for  $y$ . State the connection between this new equation and the slope and y-intercept of the line.



a)  $(0, 1)$   
 $3(0) + 2(1) = 2 \checkmark$

$(2, -2)$   
 $3(2) + 2(-2) = 2 \checkmark$

b)  $x_1 = 0$      $m = \frac{y_2 - y_1}{x_2 - x_1}$   
 $y_1 = 1$   
 $x_2 = 2$      $= \frac{-2 - 1}{2 - 0}$   
 $y_2 = -2$      $= -3/2$

The slope is  $-3/2$  and  
 the y-intercept is  $(0, 1)$

c)  $3x + 2y = 2$   
 $3x + 2y - 3x = 2 - 3x$   
 $2y = -3x + 2$   
 $\frac{2y}{2} = \frac{-3x + 2}{2}$   
 $y = -\frac{3x}{2} + \frac{2}{2}$   
 $y = -\frac{3}{2}x + 1$

### Example 2

State the slope and y-intercept of the line with equation  $4x - 3y = 6$  after solving the equation for y. Then graph the line onto Figure 2.

$$4x - 3y = 6$$

$$4x - 3y - 4x = 6 - 4x$$

$$-3y = -4x + 6$$

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

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

$$y = \frac{4}{3}x - 2$$

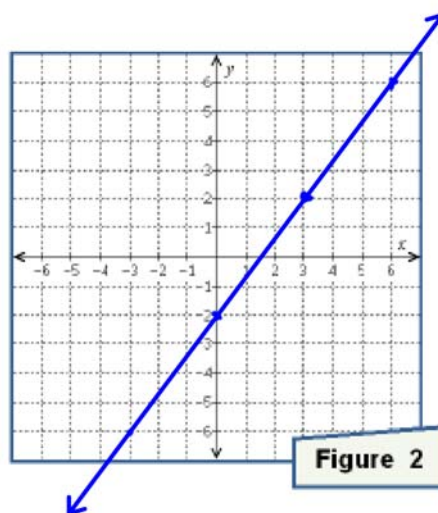


Figure 2

Check (3, 2)

$$4(3) - 3(2) = 6 \checkmark$$

### Example 3

State the slope and y-intercept of the line with equation  $-3x - 5y = 4$ . Graph the line onto Figure 3.

$$-3x - 5y = 4$$

$$-3x - 5y + 3x = 4 + 3x$$

$$-5y = 3x + 4$$

$$\frac{-5y}{-5} = \frac{3x + 4}{-5}$$

$$y = \frac{3x}{-5} + \frac{4}{-5}$$

$$y = -\frac{3}{5}x - \frac{4}{5} \leftarrow \text{hmm... } x=2, y = -\frac{6}{5} - \frac{4}{5} = -2 \text{ !!}$$

The slope is  $-\frac{3}{5}$  and the y-intercept is  $(0, -\frac{4}{5})$

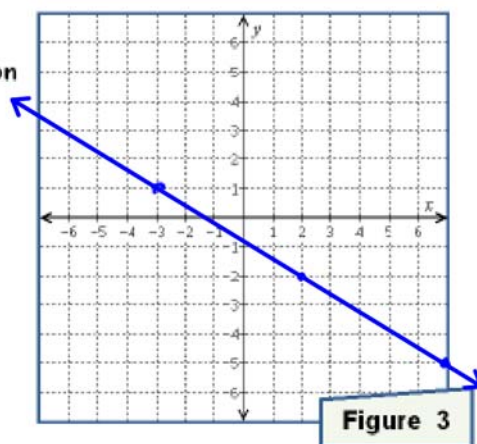


Figure 3

Check (-3, 1)

$$-3(-3) - 5(1) = 4?$$

$$9 - 5 = 4 \checkmark$$