pp. 153-155, #1-19 odd, #21, #22, #35, #36, #46, #47

1. The line falls from left to right. So, the slope is negative.

Let $(x_1, y_1) = (-3, 1)$ and $(x_2, y_2) = (2, -2)$.

$$m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{-2 - 1}{2 - (-3)} = \frac{-2 - 1}{2 + 5} = \frac{-3}{5} = -\frac{3}{5}$$

The slope is $-\frac{3}{5}$.

3. The line rises from left to right. So, the slope is positive.

Let $(x_1, y_1) = (-1, -4)$ and $(x_2, y_2) = (0, -1)$.

$$m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{-1 - (-4)}{0 - (-1)} = \frac{-1 + 4}{0 + 1} = \frac{3}{1} = 3$$

The slope is 3.

5. Let $(x_1, y_1) = (1, 4)$ and $(x_2, y_2) = (3, -6)$.

$$m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{-6 - 4}{3 - 1} = \frac{-10}{2} = -5$$

The slope is -5.

7. $$m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{2 - 0}{-1 - (-5)} = \frac{2 - 0}{-1 + 5} = \frac{2}{4} = \frac{1}{2}$$

The slope is $\frac{1}{2}$.

9. $m = \dfrac{y_2 - y_1}{x_2 - x_1} = \dfrac{4 - 0}{0 - 0} = \dfrac{4}{0}$

The slope is undefined.

11. $m = \dfrac{y_2 - y_1}{x_2 - x_1} = \dfrac{120 - 60}{2 - 1} = \dfrac{60}{1} = 60$

The slope is 60, which means that the distance was increasing by 60 miles for every increase of 1 hour. So, the bus was traveling at 60 miles per hour.

13. $y = mx + b$

$y = -3x + 2$

The slope is -3 and the y-intercept is 2.

15. $y = mx + b$

$y = 6x + 0$

The slope is 6 and the y-intercept is 0.

17. $-0.75x + y = 4$

$y = 0.75x + 4$

The slope is 0.75 and the y-intercept is 4.

19. $\frac{1}{6}x = \frac{1}{3} - y$

$y + \frac{1}{6}x = \frac{1}{3}$

$y = -\frac{1}{6}x + \frac{1}{3}$

The slope is $-\frac{1}{6}$ and the y-intercept is $\frac{1}{3}$.

21. The equation needs to be in slope-intercept form. So, you should solve the equation for y before identifying the slope and y-intercept.

$$x = -4y$$

$$-4y = x$$

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

$$y = -\frac{1}{4}x$$

$$y = -\frac{1}{4}x + 0$$

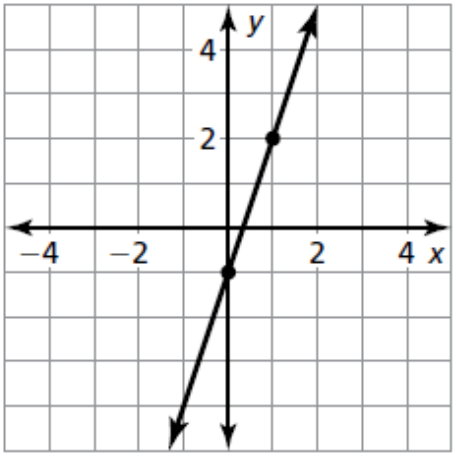
The slope is $-\frac{1}{4}$ and the y-intercept is 0.

22. Because there is an addition sign in the slope-intercept form of a linear equation, $y = mx + b$, you should rewrite $y = 3x - 6$ as $y = 3x + (-6)$ to show that the y-intercept is negative. The slope is 3 and the y-intercept is -6.

35. The slope is 3, which can be written as $\frac{3}{1}$. So, you should plot the point that is 1 unit right and 3 units up from the y-intercept.

$$y + 1 = 3x$$
$$\underline{-1} \quad \underline{-1}$$
$$y = 3x - 1$$
$$y = 3x + (-1)$$

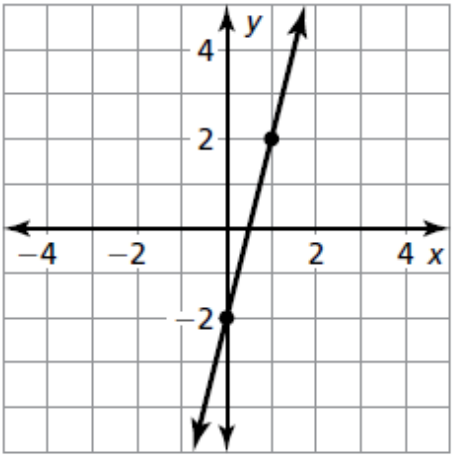
$m = 3, b = -1$



36. The slope should be 4, and the y-intercept should be -2, not the other way around.

$$-4x + y = -2$$
$$\underline{+ 4x} \qquad \underline{+ 4x}$$
$$y = 4x - 2$$
$$y = 4x + (-2)$$

$m = 4, b = -2$



46. You cannot write the equation of a vertical line, such as $x = 9$, in slope-intercept form; *Sample answer:* You cannot solve for y when the equation does not have a y in it. Also, in order to use slope-intercept form, the function must have a slope and an intercept, but the slope of a vertical line is undefined.

47. **a.** $y = \frac{1}{3}x + 5$; The graph and the equation both have a positive slope and a positive intercept.

b. $y = \frac{7}{4}x - \frac{1}{4}$; $y = 2x - 4$; The graph and both equations have a positive slope and a negative intercept.

c. $y = -3x + 8$; The graph and the equation have a negative slope and a positive intercept.

d. $y = -x - \frac{4}{3}$, $y = -4x - 9$; The graph and both equations have a negative slope and a negative intercept.