

Section 1.4 Writing Linear Equations

Three forms of a linear equation

Standard Form

$$Ax + By = C$$

Point Slope Form

$$y - y_1 = m(x - x_1)$$

coordinate of a point on the line

Slope Intercept Form

$$y = mx + b$$

y intercept

$$g(x) = 2x - 1$$

$$h(x) = 1 - g(x)$$

The functions g and h are defined above. What is the value of $h(0)$?

- A) -2
- B) 0
- C) 1
- D) 2

Write the equation of the line that passes through the point (6,-3) with slope of $\frac{1}{2}$ in point slope form.

$$y - y_1 = m(x - x_1)$$

x_1, y_1

$\frac{1}{2}$

$$y - -3 = \frac{1}{2}(x - 6)$$

$$y + 3 = \frac{1}{2}(x - 6) \quad y - 4 = -\frac{1}{2}(x + 2)$$

Write the equation of the line that passes through the point (-3,2) with slope of $\frac{2}{5}$ in point slope form.

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

x_1, y_1

Write the equation of the line that passes through the points (3,5) and (-2,7) in point slope form.

$$y - 5 = -\frac{2}{5}(x - 3)$$

$$y - 7 = -\frac{2}{5}(x + 2)$$

$$m = \frac{y_2 - y_1}{x_2 - x_1}$$

$$m = \frac{7 - 5}{-2 - 3} = \frac{2}{-5}$$

Determine a point on the line and find the slope.

$$y + 6 = \frac{-3}{5}(x - 2)$$

$$m = -\frac{3}{5}$$

$$(2, -6)$$

Determine a point on the line and find the slope.

$$y - 7 = \frac{6}{8}(x + 5)$$

$$m = \frac{6}{8}$$

$$(-5, 7)$$

Determine a point on the line and find the slope.

$$y + 4 = \frac{-5}{7}(x + 3)$$

Slope Intercept Form $y = mx + b$ b is the y intercept

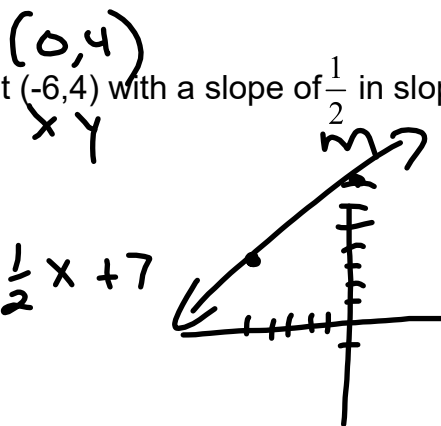
Write an equation of a line that goes through the point $(-6, 4)$ with a slope of $\frac{1}{2}$ in slope intercept form.

$$4 = \frac{1}{2} \left(\frac{-6}{1} \right) + b$$

$$4 = \frac{-3}{1} + b$$

$$7 = b$$

$$y = \frac{1}{2}x + 7$$



Write an equation of a line that goes through the point $(-9, -2)$ with a slope of $\frac{2}{3}$ in slope intercept form.

$$y = mx + b$$

$$-2 = \frac{2}{3} \left(\frac{-9}{1} \right) + b$$

$$-2 = -6 + b$$

$$4 = b$$

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

$$y = mx + b$$

Write an equation of a line that goes through the point $(4, -6)$ with a slope of $\frac{1}{3}$ in slope intercept form.

$$\begin{aligned}
 -6 &= \frac{1}{3}\left(\frac{4}{1}\right) + b \\
 \therefore -6 &= \frac{4}{3} + b \cdot 3 & y &= \frac{1}{3}x - \frac{22}{3} \\
 -18 &= 4 + 3b \\
 -\frac{22}{3} &= \frac{4}{3} + b
 \end{aligned}$$

Write an equation of a line that goes through the point $(-1, 5)$ with a slope of $-\frac{2}{5}$ in slope intercept form.

$$\begin{aligned}
 y &= mx + b \\
 5 &= -\frac{2}{5}\left(\frac{-1}{1}\right) + b \\
 5 \cdot 5 &= \frac{-2}{5} + b \cdot 5 & -\frac{2}{5} \cdot 1 &= \frac{2}{5} \\
 25 &= -2 + 5b \\
 \frac{27}{5} &= \frac{-2}{5} + b & y &= -\frac{2}{5}x + \frac{27}{5}
 \end{aligned}$$

$$y = mx + b$$

Write the equation of the line that passes through the points (5,-7) and (2,4) in slope intercept form.

$$\begin{aligned}
 12 \cdot 4 &= -\frac{11}{3}(2) + b \\
 48 &= -\frac{22}{3} + b \\
 + \frac{48}{1} &= -\frac{22}{3} + \frac{12b}{1} \\
 \frac{136}{12} &= \frac{12b}{12}
 \end{aligned}$$

$$\begin{aligned}
 & \times 4 \\
 m &= \frac{4 - (-7)}{2 - 5} = \frac{11}{-3}
 \end{aligned}$$

$$y = -\frac{11}{3}x + \frac{34}{3}$$

Write the equation of the line that passes through the points (-2,3) and (1,-2) in slope intercept form.

$$y = mx + b$$

Write the equation of the line that passes through the points (10,-4) and (3,-1) in slope intercept form.

Write the equation of the line that passes through the points (2,-3) and (-4,1) in point slope form.