

Sec. 5.4 The Slope-Intercept Form

Slope-Intercept Form

$m \rightarrow$ slope

$b \rightarrow$ y-intercept:
where the line crosses the y-axis

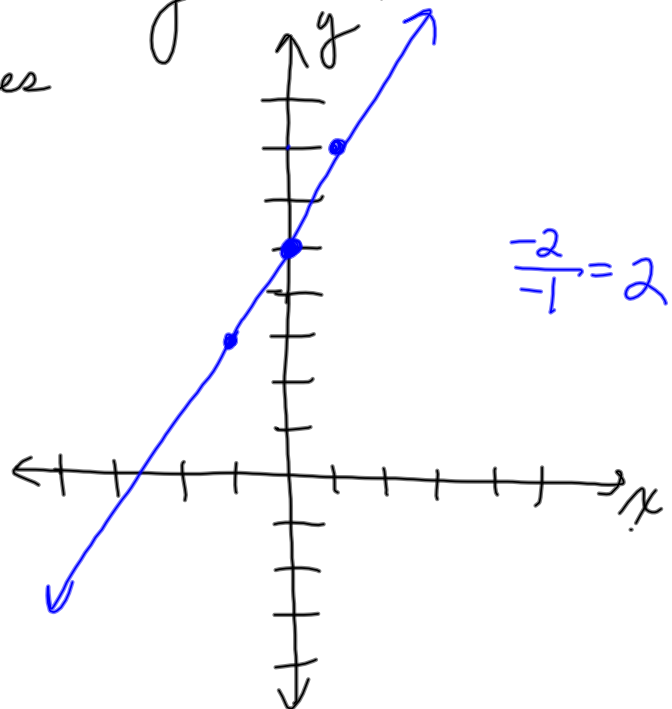
$$y = mx + b$$

Graph:

a. $y = 2x + 5$

\downarrow
(0, 5)
y-int = 5

$m = \frac{2}{1}$

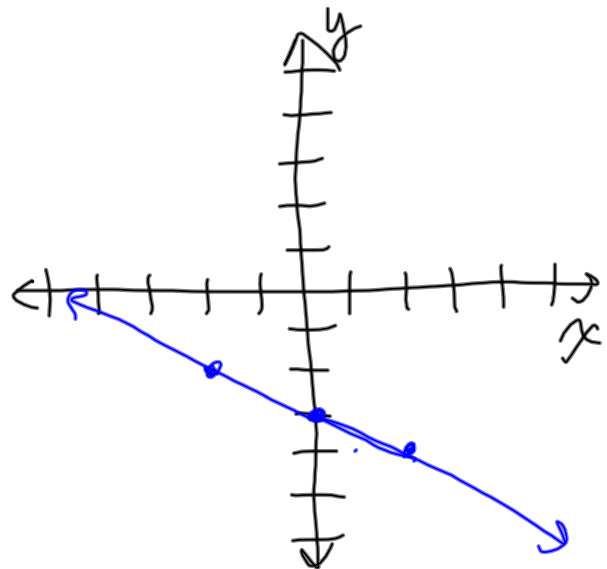


b. $y = -\frac{1}{2}x - 3$

\downarrow
(0, -3)

$m = -\frac{1}{2}$

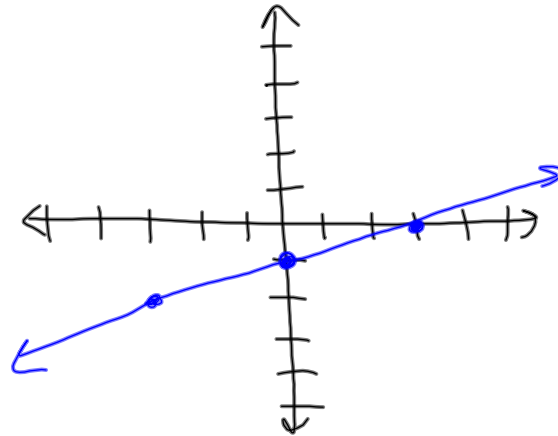
$-\frac{1}{2} \quad -\frac{1}{2}$



$$c. \quad y = \frac{1}{3}x - 1$$

$(0, -1)$

$$m = \frac{1}{3}$$



Write an equation in slope-intercept form for the line that contains each pair of points.

a. $(-4, 7)$ and $(10, 0)$

① Find slope $m = \frac{y_2 - y_1}{x_2 - x_1}$

$$m = \frac{0 - 7}{10 - (-4)} = \frac{-7}{14} = -\frac{1}{2}$$

$$y = mx + b$$

② Find y-int, b , by choosing one point

$$y = mx + b \quad \begin{matrix} (10, 0) \\ x \quad y \end{matrix} \quad m = -\frac{1}{2}$$

$$0 = -\frac{1}{2}(10) + b$$

$$0 = -5 + b$$

$$\begin{array}{r} +5 \quad +5 \\ \hline 5 = b \end{array}$$

③ Write the equation using m and b .

$$y = -\frac{1}{2}x + 5$$

b. $(3, 3)$ and $(5, 7)$

$$\textcircled{1} \quad m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{7 - 3}{5 - 3} = \frac{4}{2} = 2$$

$$\textcircled{2} \quad \begin{array}{l} x \quad y \\ (3, 3) \\ m = 2 \end{array}$$

$$\begin{aligned} y &= mx + b \\ 3 &= 2 \cdot 3 + b \\ 3 &= 6 + b \\ \underline{-6 \quad -6} \\ -3 &= b \end{aligned}$$

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(18-27)
all

$$\textcircled{3} \quad y = 2x - 3$$