

Example*Writing an Equation of a Line Given Two Points*

Write an equation of the line that passes through the points $(-2, 1)$ and $(-4, -3)$.

First, find the slope, m , for $(x_1, y_1) = (-2, 1)$ and $(x_2, y_2) = (-4, -3)$.

$$m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{-3 - 1}{-4 - (-2)} = \frac{-4}{-4 + 2} = \frac{-4}{-2} = 2$$

Now, choose either point and solve for b .

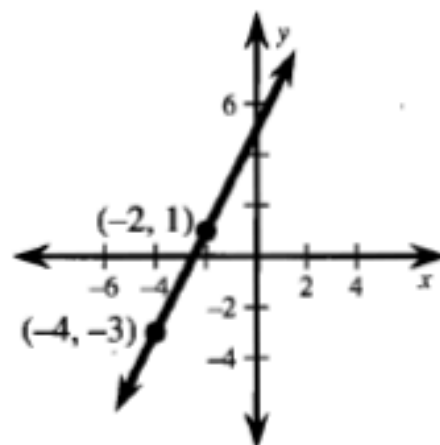
$$y = mx + b \quad \text{Slope-intercept form}$$

$$1 = 2(-2) + b \quad \text{Substitute 2 for } m, -2 \text{ for } x, \text{ and 1 for } y.$$

$$1 = -4 + b \quad \text{Simplify.}$$

$$5 = b \quad \text{Solve for } b.$$

The slope-intercept form of the equation of the line is $y = 2x + 5$.

*Guidelines:*

To write an equation of a nonvertical line given two points on the line:

- Find the slope.
- Find the y -intercept.
- Write the equation using slope-intercept form $y = mx + b$.