

Two ways to find an equation of the line through two points
(or a point w/a given slope)

Section
5.2

Find an equation of the line containing the given pair of points. $(2, 1)$ and $(6, 3)$
 x_1, y_1 x_2, y_2

In both methods, you must find the slope first

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

Method 1: Using point-slope form, $y - y_1 = m(x - x_1)$

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

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

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

Method 2: Using slope-intercept form, $y = mx + b$
and solving for b

$$y = \frac{1}{2}x + b \quad \text{use the first point}$$

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

$$1 = 1 + b$$

$$\begin{array}{r} -1 \quad -1 \\ \hline b = 0 \end{array}$$

$$\text{So } y = \frac{1}{2}x$$

(Personally prefer this method because it's one less formula to remember. Use whichever method is easier for you.)