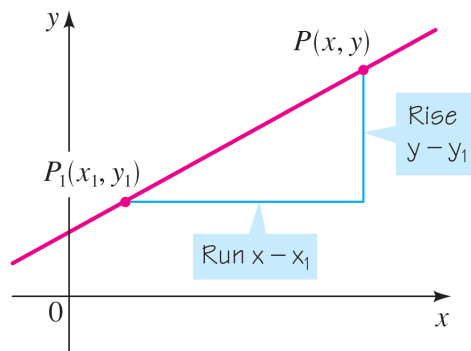


Point-Slope Form of the Equation of a Line



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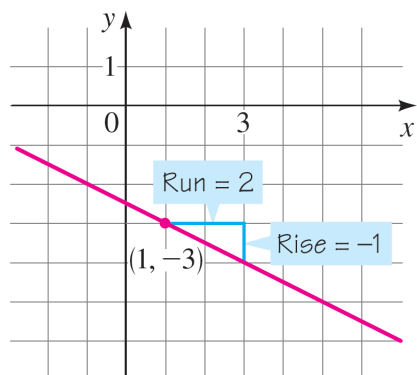
An equation of the line that passes through the point (x_1, y_1) and has slope m is

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

EXAMPLE: Find an equation of the line through $(1, -3)$ with slope $-\frac{1}{2}$ and sketch the line.

Solution: Using the point-slope form with $m = -\frac{1}{2}$, $x_1 = 1$, and $y_1 = -3$, we obtain an equation of the line as

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



EXAMPLE: Find an equation of the line through the points $(-1, 2)$ and $(3, -4)$.

Solution: The slope of the line is

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

Using the point-slope form with $x_1 = -1$ and $y_1 = 2$, we obtain

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