7.3 Slope-Point Form

Use this to get the equation if you are given the slope (m), and any point on the line except the y-intercept.

Formula for slope: \[ m = \frac{y_2 - y_1}{x_2 - x_1} \]

\[(x - x_1) m = y - y_1\]

But we like to see the y on the left hand side.

\[y - y_1 = m (x - x_1)\]

\[\uparrow\]

this is the point slope form of the equation of a line.

Ex1: Write the equation of a line with slope \( \frac{1}{2} \), passing through the point \((4,0)\).

\[y - y_1 = m(x - x_1)\]

\[y - 0 = \frac{1}{2}(x - 4)\]

\[y = \frac{1}{2}(x - 4) \equiv \text{slope-point form.}\]

now simplify: \[y = \frac{1}{2}x - 2 \equiv \text{slope-intercept form.}\]

Try this: Slope is \(-3\), point on line \((-2, 5)\).

\[y - y_1 = m(x - x_1)\]

\[\text{Page 377 } 1-7 \text{ odd letters, II.}\]