5.7 Point-Slope Form

Graph the line that passes through the point $(3, -5)$ and has a slope of $\frac{2}{5}$

Graph the line that passes through the point $(-2, 4)$ and has a slope of $\frac{-1}{2}$
5.7 Point-Slope Form

For a line with slope $m$ that contains the point $(x_1, y_1)$, the point-slope form of the line is:

\[ y - y_1 = m(x - x_1) \]
Write an equation in point-slope form for the line that has the given slope and passes through the given point.

\[ m = 3 \quad \text{point} \quad (5, 4) \]

\[ y - 4 = 3(x - 5) \]

\[ m = 3 \quad \text{point} \quad (-5, -4) \]

\[ y + 4 = 3(x + 5) \]

\[ y - y_1 = \frac{2}{3}(x + 8) \]

\[ m = \frac{2}{3} \quad \text{point} \quad (-8, y_1) \]
Write an equation in point-slope form for the line that has the given slope and passes through the given point.

\[ m = \frac{2}{5} \quad \text{point} = ( -3, 7 ) \]

\[ y - 7 = \frac{2}{5} ( x + 3 ) \]
Write an equation in **slope-intercept form**
for the line that has slope = -4 and passes
through the point (5, -2)

\[
\begin{align*}
\text{Option #1} \\
y = mx + b \\
-2 = -4(5) + b \\
-2 = -20 + b \\
\Rightarrow b = 18 \\
y = -4x + 18
\end{align*}
\]

\[
\begin{align*}
\text{Option #2} \\
y + 2 = -4(x - 5) \\
y + 2 = -4x + 20 \\
\Rightarrow y = -4x + 18
\end{align*}
\]

**Standard Form:**
\[
4x + y = 18
\]

\[
y = 500 + 30x \\
.50x + l_y = 60
\]
Write an equation in **point-slope form** of the line that passes through (1, 6) and (3, -4)

\[
m = \frac{-5}{1} = \frac{-4 - 6}{3 - 1} = \frac{-10}{2} = \frac{-5}{1}
\]

\[
y - 6 = -5(x - 1) \text{ or } y + 4 = -5(x - 3)
\]

Write an equation in **slope-intercept form** of the line that passes through (1, 6) and (3, -4)

\[
y - 6 = -5(x - 1) \text{ or } y + 4 = -5(x - 3)
\]

\[
y - 6 = -5x + 5
\]

\[
y = -5x + 11
\]

\[
y + 4 = -5x + 15
\]

\[
y = -5x + 11
\]