Point-Slope Form of a Line
Preliminaries

- Equation for slope
- Slope-Intercept form of a line

Objectives

- Find the equation of a line, given the slope of the line and a point on the line
Example 1

\[
\frac{y - 4}{x - 1} = \frac{2}{3}
\]

\[
y - 4 = \frac{2}{3}(x - 1)
\]
Example 1

\[
\frac{y - 4}{x - 1} = \frac{2}{3}
\]

\[
y - 4 = \frac{2}{3}(x - 1)
\]
Example 2

\[
\frac{y - 5}{x - 6} = \frac{3}{2}
\]

\[y - 5 = \frac{3}{2}(x - 6)\]
Example 1

\[ m = \frac{2}{3} \]

\[ \frac{b - 4}{0 - 1} = \frac{2}{3} \]

\[ b - 4 = -\frac{2}{3} \]

\[ b = -\frac{2}{3} + 4 = \frac{10}{3} \]
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Example 2

Find the equation of the line with slope $m = \frac{3}{2}$, through the point $(6, 5)$

$$y = \frac{3}{2}x - 4$$
Example 2

\[
\frac{y - 5}{x - 6} = \frac{3}{2}
\]

\[
y - 5 = \frac{3}{2}(x - 6)
\]

\[
y - 5 = \frac{3}{2}x - 9
\]

\[
y = \frac{3}{2}x - 4
\]
Example 1

\[
\begin{align*}
    \frac{b - 4}{0 - 1} &= \frac{2}{3} \\
    b - 4 &= -\frac{2}{3} \\
    b &= -\frac{2}{3} + 4 = \frac{10}{3}
\end{align*}
\]
Example 2

\[ m = \frac{3}{2} \]

\[ \frac{b - 5}{0 - 6} = \frac{3}{2} \]

\[ b - 5 = -9 \]

\[ b = -4 \]
Recap

\[
\frac{y - k}{x - h} = m
\]

Point-Slope Form of a Line

\[
y - k = m(x - h)
\]