Preliminaries and Objectives

The Slope of a Line

Preliminaries
- Rates of Change

Objectives
- Formally define the slope of a line
- Use the slope to find missing values

The Slope Formula

\[ \text{slope} = \frac{y_2 - y_1}{x_2 - x_1} = \frac{3}{4} \]

Interpolation

\[ \text{slope} = \frac{25 - 10}{9 - 3} = \frac{15}{6} = \frac{5}{2} \]
Finding Missing Input Value

- Given points: (3, 10) and (9, 25)
- Calculate slope: \[ \text{slope} = \frac{25 - 10}{9 - 3} = \frac{15}{6} = \frac{5}{2} \]
- Calculate x: \[ \frac{15 - 10}{x - 3} = \frac{5}{2} \Rightarrow x = 5 \]

Recap

- Given points: (x_1, y_1) and (x_2, y_2)
- Calculate slope: \[ \text{slope} = \frac{y_2 - y_1}{x_2 - x_1} \]

Point-Point Form of a Line

Find the equation of a line passing through the points (2, 1) and (6, 4).

- Calculate slope: \[ \text{slope} = \frac{4 - 1}{6 - 2} = \frac{3}{4} = \frac{y - 4}{x - 6} \]

Credits

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Recap

The slope of a line between two points \((x_1, y_1)\) and \((x_2, y_2)\) is given by:

\[
slope = \frac{y_2 - y_1}{x_2 - x_1}
\]