The Slope of a Line

Preliminaries and Objectives

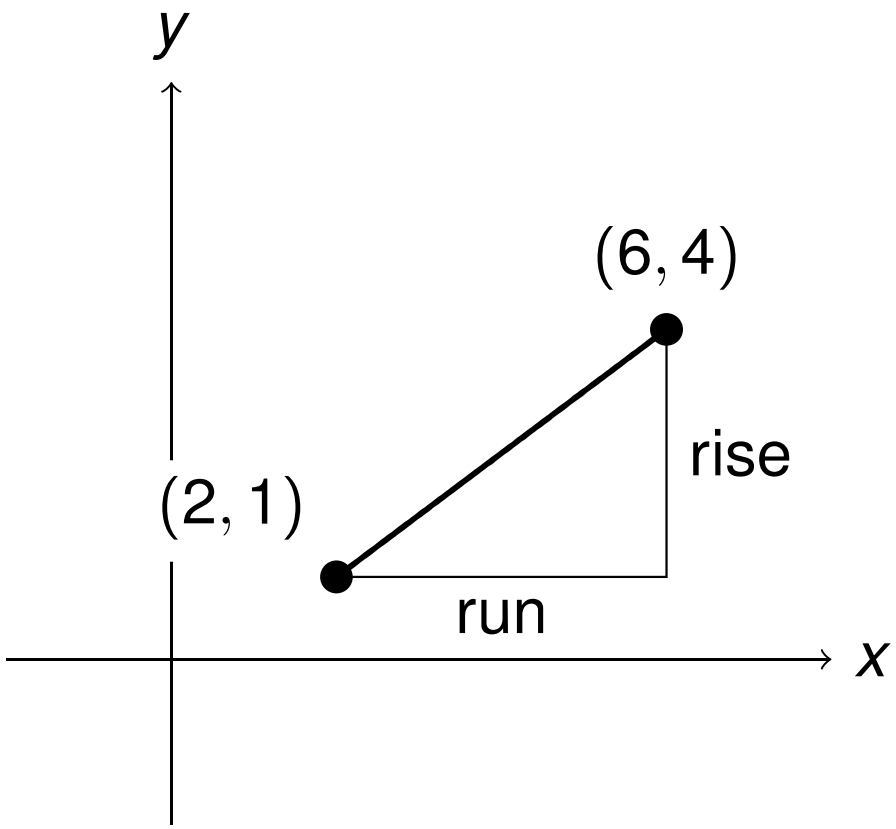
Preliminaries

- Rates of Change

Objectives

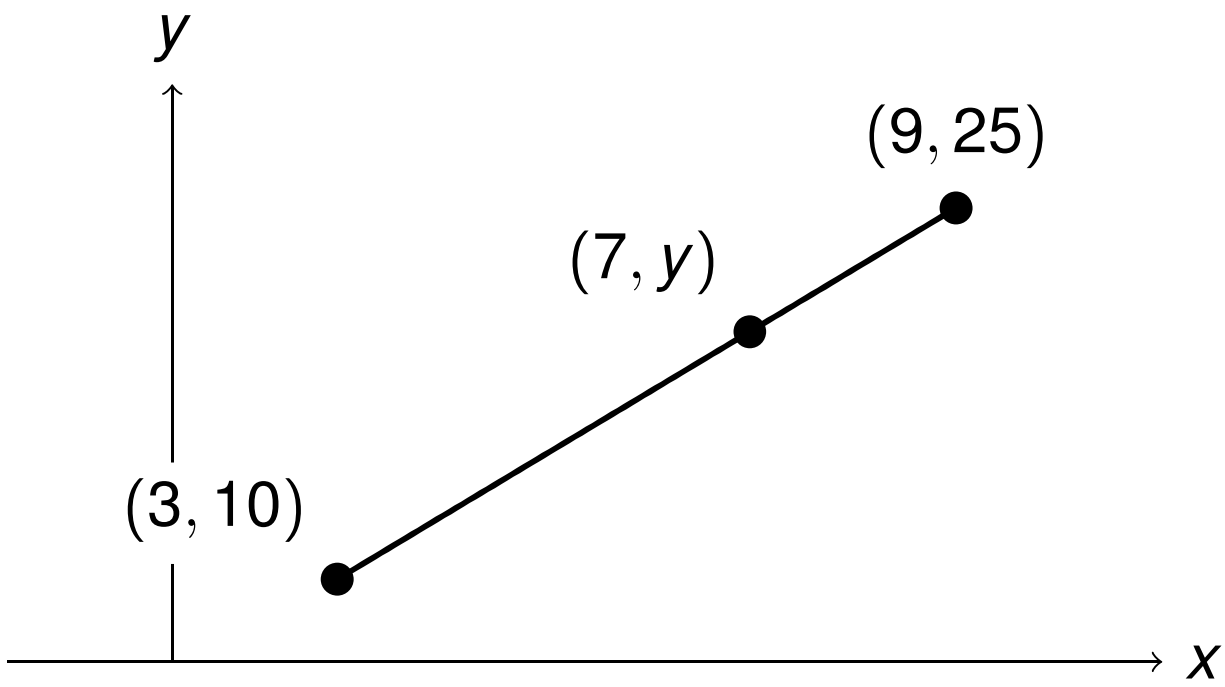
- Formally define the slope of a line
- Use the slope to find missing values

The Slope Formula



$$\text{slope} = \frac{4-1}{6-2} = \frac{3}{4}$$

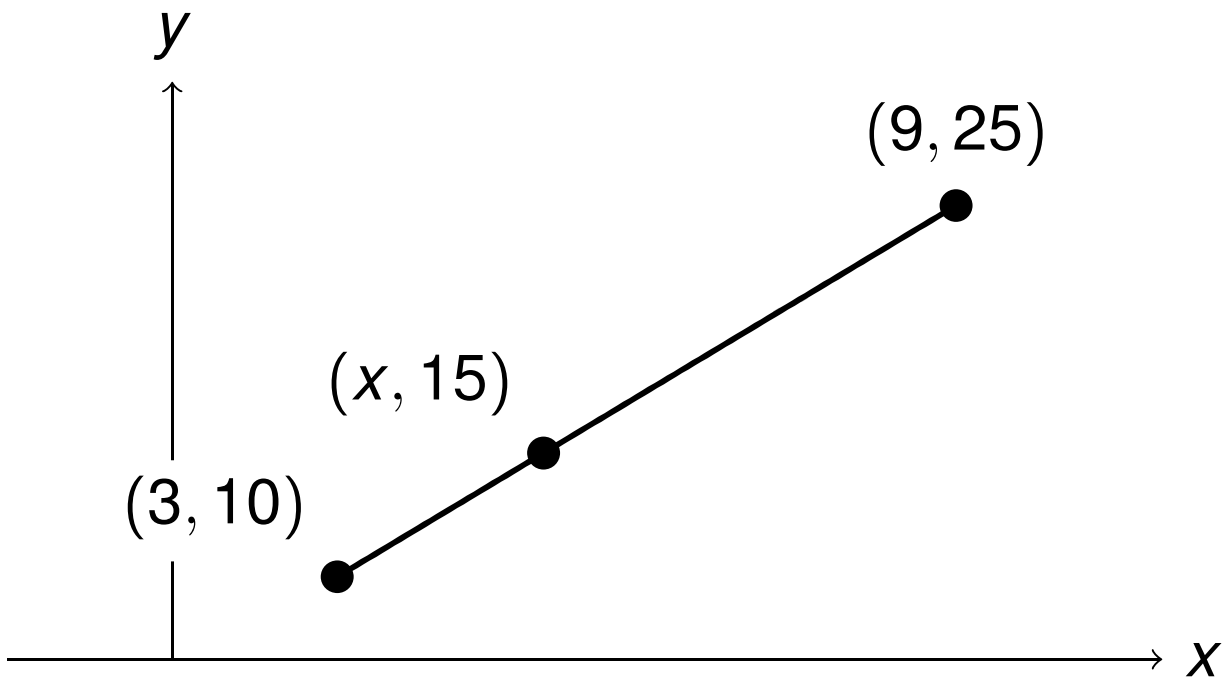
Interpolation



x	y
3	10
7	
9	25

$$\text{slope} = \frac{25 - 10}{9 - 3} = \frac{15}{6} = \frac{5}{2}$$

Finding Missing Input Value

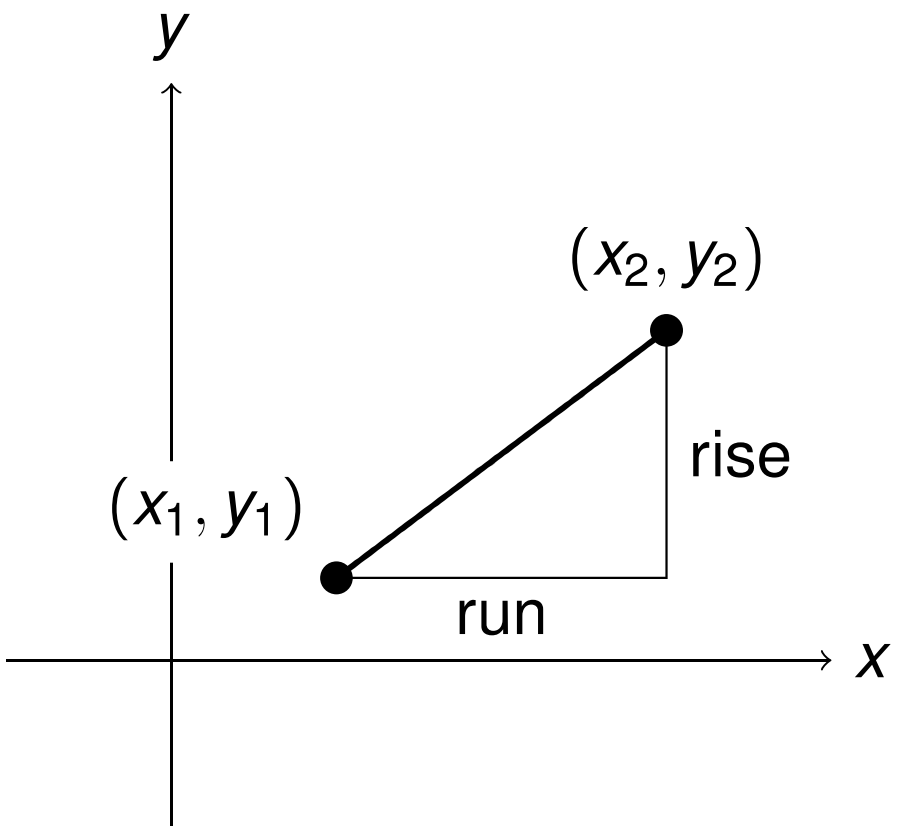


x	y
3	10
	15
9	25

$$\text{slope} = \frac{25-10}{9-3} = \frac{15}{6} = \frac{5}{2}$$

$$\Rightarrow \frac{15-10}{x-3} = \frac{5}{2} \Rightarrow x = 5$$

Recap



$$\text{slope} = \frac{y_2 - y_1}{x_2 - x_1}$$

Credits

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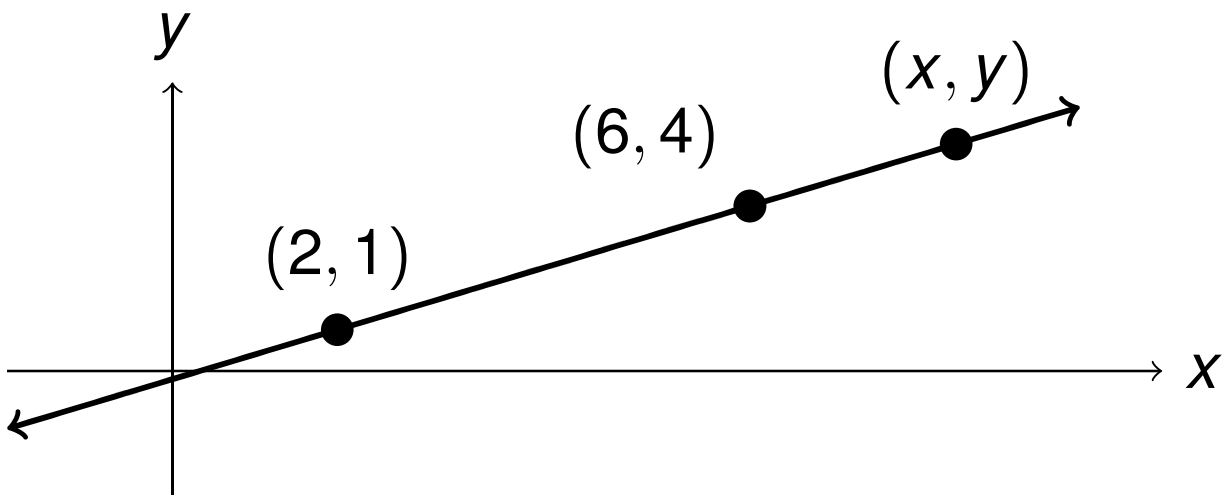
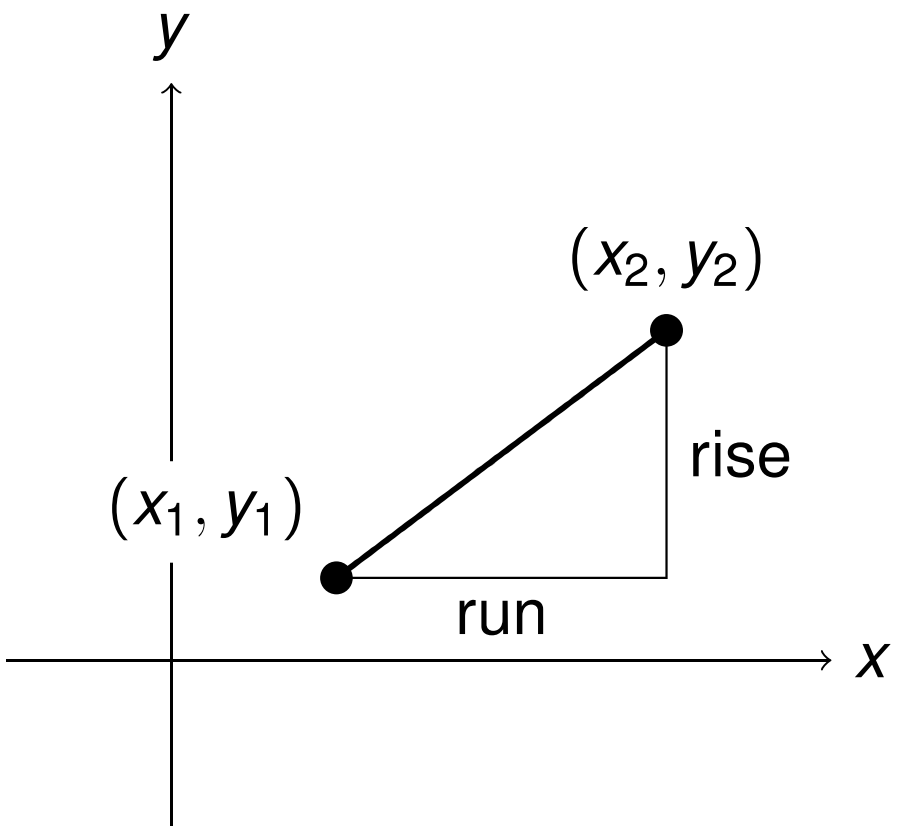
Point-Point Form of a Line

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



$$\text{slope} = \frac{4-1}{6-2} = \frac{3}{4} = \frac{y-4}{x-6}$$

Recap



$$\text{slope} = \frac{y_2 - y_1}{x_2 - x_1}$$