All About Slopes

Slope (measures steepness of a line) = \( m = \frac{\text{rise}}{\text{run}} = \frac{\text{change in } y}{\text{change in } x} = \frac{y_2 - y_1}{x_2 - x_1} \)

Types of Slopes

Slopes come in 4 different types: negative, positive, zero, and undefined.

**Negative Slope**

Line goes downward to the right as \( x \) increases.

\( m < 0 \)

**Positive Slope**

Line goes upward to the right as \( x \) increases.

\( m > 0 \)
Finding Rate of Change

The slope of a line can also be interpreted as the “average rate of change”. It tells us how fast \( y \) is changing with respect to \( x \).

The slope of a graph is a rate of change:

### Zero Slope

A horizontal line has a slope of zero.

\[ m = 0 \]

For any two points, the \( y \) values will be equal to the same real number. The equation will be \( y = \) some number.

### Undefined Slope

A vertical line has an undefined slope.

\[ m \text{ is undefined} \]

For any two point, the \( x \) values will be equal to the same real number. The equation will be \( x = \) some number.