

Gradient - Steepness of a Line



Key idea

Gradient measures how steep a line is.

$\text{gradient} = \frac{\text{rise}}{\text{run}}$ (vertical change over horizontal change).

Method

1. Rise: up is +, down is -.
2. Run: how far across.
3. Divide: $\text{gradient} = \frac{\text{rise}}{\text{run}}$.

Example

From (0, 1) to (1, 3): rise 2, run 1.

$$\text{gradient} = \frac{2}{1} = 2.$$

Common mistake

Keep the sign.

A line going **down** to the right has a **negative** gradient.

Direction and Comparing Gradients



Key idea

Positive gradient rises to the right.

Negative gradient falls to the right.

A horizontal line has gradient 0.

Negative example

From $(1, 5)$ to $(2, 4)$: down 1, across 1.

gradient = -1 .

From a table

$(0, 2), (1, 4), (2, 6)$: y rises 2 each time x rises 1.

gradient = 2.

Common mistake

For steepness, compare the **size** of the fraction.

A gradient of -3 is steeper than $+1$.

