

What Makes a Function

8th Grade

One input, one output — and the two tests that check it.

A relation is a function when every input has exactly one output. Inputs may not repeat with different outputs.

$f(x)$ — one x in, one y out

$\{(1,2), (2,4), (3,6)\}$

function

Every input appears once.

$\{(1,2), (1,5)\}$

not a function

The input 1 has two different outputs.

Vertical line test

on a graph

If a vertical line hits twice, it is not a function.

$\{(1,2), (3,2)\}$

function

Outputs may repeat. Inputs may not.

THE COMMON MISTAKE

✗ repeated y values break it

✓ repeated x values with different y break it

Outputs can repeat freely. $y = 5$ is a perfectly good function.

$f(x)$ is not f times x . It means the output of f when the input is x .