

Domain and Range

9th Grade

Which inputs are allowed, and which outputs actually appear.

Domain is the set of allowed inputs. Range is the set of outputs the function actually produces.

domain: x-values · range: y-values

$$f(x) = 2x + 1$$

Nothing is forbidden.

domain all reals

$$f(x) = 1/(x-3)$$

Division by zero is undefined.

$x \neq 3$

$$f(x) = \sqrt{x-2}$$

You cannot square-root a negative.

$x \geq 2$

$$f(x) = x^2$$

A square is never negative.

range $y \geq 0$

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✗ giving the range as 'all reals' for x^2

✓ range is $y \geq 0$

Look at what the graph actually reaches, not at what x is allowed to be.

Domain reads left to right on the graph. Range reads bottom to top.