

Function Toolkit

9th Grade

Domain, range, notation and the parent functions with their graphs.

FUNCTION NOTATION

$$f(x) = 2x + 1 \rightarrow f(3) = 7$$

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

A relation is a function when every input has exactly one output — the vertical line test.

DOMAIN & RANGE

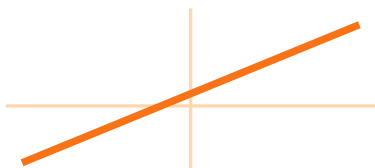
Domain every input x is allowed — watch for $\div 0$ and $\sqrt{\text{negative}}$.

Range every output y the function can actually produce.

PARENT FUNCTIONS

Linear

$$f(x) = x$$



straight line

Quadratic

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



parabola, opens up

Absolute value

$$f(x) = |x|$$



V shape

Square root

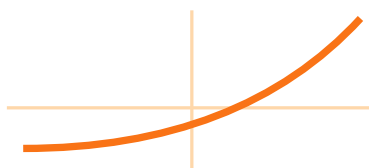
$$f(x) = \sqrt{x}$$



half a sideways parabola

Exponential

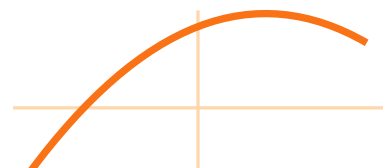
$$f(x) = 2^x$$



flat then steep

Cubic

$$f(x) = x^3$$



S through the origin

READING A GRAPH x -intercepts are the zeros. The y -intercept is $f(0)$.