Domain of a Function

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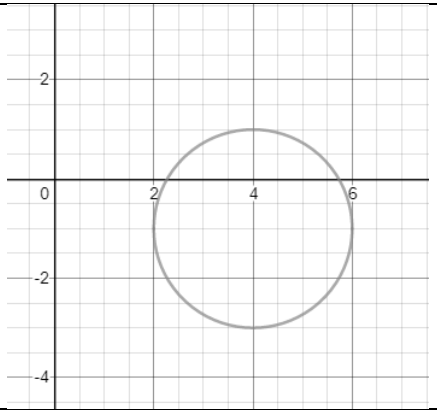
The **domain** of a function is the allowed values for the input variable, which is usually called x.

The domain is "all real x", which can also be written $x \in \mathbb{R}$, except in the following cases:

Cases	Examples	Domain of examples
1. **The domain is specified**	f: {(2, 3), (4, 5), (6, 7)} $y = x^2, x \geq 0$	x = 2, 4, 6 $x \geq 0$
2. A graph: To find the domain, read it off the graph.		all real $x \mid 2 \leq x \leq 6$
3. **Division by zero** (To find the domain, set the denominator ≠ 0.)	$y = \frac{3}{x-2}$	$x - 2 \neq 0$, which gives all real $x \neq 2$
	$y = \frac{1}{x^2-4}$	$x^2 - 4 \neq 0$, which gives all real $x \neq \pm 2$
4. **square roots of negative numbers** (To find the domain Set the argument (i.e. the stuff inside the root) ≥ 0).	$y = \sqrt{x-1}$	$x - 1 \geq 0$, which gives all real $x \geq 1$
	$y = \sqrt{x^2-9}$	$x^2 - 9 \geq 0$, which gives all real $x \mid x \leq -3$ or $x \geq 3$
	$y = \sqrt[3]{x}$	all real x (Because the rule doesn't apply to odd roots.)