MATH180 - REC NOTES
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Functions:

Rule: Take a number and subtract 7

$f(x) = x-7 \quad f(3) = 3-7 = -4$

Rule: Take the square of a number, add 1.

$f(x) = x^2+1 \quad f(3) = 3^2+1 = 10$

$f(-3) = -3^2+1 = 10$

Not all functions work with all numbers

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

$f(x)$ - dependent variable

x - independent variable

Rule: Take $\sqrt{4}$ (not a function because no variable)

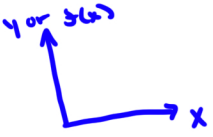
Rule: Take a number and assign to $\sqrt{4}$ (function)

↳ $x = \sqrt{4}$

e.g. $3 = \sqrt{4}$

$5 = \sqrt{4}$

Graphs



Cannot Divide by zero

$g(x) = \frac{1}{x-1} \rightarrow x-1 = 0$

$(-\infty, 1) \cup (1, \infty)$ or $\mathbb{R} - \{1\}$

↳ interval notation

not a function
multiple y
for one x

Not all functions work with every number

Rule: Take $\sqrt{\ }$ of a number

$f(x) = \sqrt{x}$ (can't have negative domain as a function)

Numbers that work are called the domain

Can have multiple functions that combine

Rule: $f(x) = \frac{1}{\sqrt{x}} + \frac{1}{x^2-1}$

$\neq 0$ ↳ $x^2-1 = 0$

$\sqrt{x^2} = \sqrt{1}$

$x = \pm 1$

Domain: $[0,1) \cup (1, \infty)$

$\mathbb{R}_{\geq 0} - \{1\}$

greater than

function
one y for
one x

y-axis = range

x-axis = domain

It asked to sketch a graph with an equation, solve to plot points.

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

Find $f(3)$.

$f(3) = 3^2+1 = 10$

$g(x) = \sqrt{x} + \frac{1}{x^2-1}$

Find $g(4)$.

$g(4) = \sqrt{4} + \frac{1}{(4)^2-1} =$

$= 2 + \frac{1}{15}$

Find $g(f(x))$.

$g(f(x)) = \sqrt{x^2+1} + \frac{1}{(x^2+1)^2-1}$

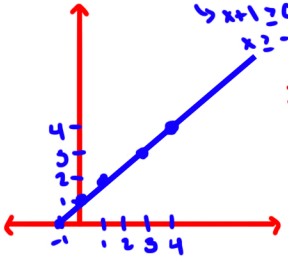
$f(x) = \sqrt{x+1}$

↳ $x+1 \geq 0$

$x \geq -1$

Domain: $(-1, \infty)$

Range: $(0, \infty)$



If an assigned value does not fall on the graph, the answer is 'undefined'.