Section 1.2 Functions and their properties

Function: is a rule that assigns one value of the dependent variable (output/y) for each value of the independent variable (input/x). "One y for each x"

Recall vertical line test when looking at graphs

For equations pick x values to see if there is a unique output (only one answer)

Domain: set of input values

Range: set of output values

*****Give answers in interval notation!**

- denominator $\neq 0$
- under $\sqrt{\ } \geq 0$

Ex 1) Find the domain of each function

a) $f(x) = \sqrt{x+3}$

$\sqrt{\ }$ $x + 3 \geq 0$

$x \geq -3$

$[-3, \infty)$

b) $m(x) = \dfrac{x}{x-5}$ $x - 5 \neq 0$

$x \neq 5$

5

$(-\infty, 5) \cup (5, \infty)$

c) $j(x) = \dfrac{\sqrt{x}}{x-5}$ $\sqrt{x} \geq 0$ $x - 5 \neq 0$

$x \geq 0$ and $x \neq 5$

0 5

$[0, 5) \cup (5, \infty)$

d) $g(x) = \sqrt{x-16}$ $x - 16 \geq 0$

$x \geq 16$

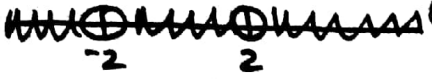
$[16, \infty)$

e) $h(x) = \dfrac{x}{x^2 - 4}$

$\dfrac{x}{(x-2)(x+2)}$

$x-2 \neq 0 \qquad x+2 \neq 0$

$x \neq 2 \qquad x \neq -2$

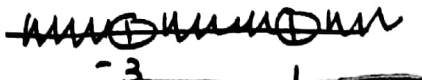


$(-\infty, -2) \cup (-2, 2) \cup (2, \infty)$

f) $c(x) = \dfrac{3x-1}{(x+3)(x-1)}$

$x+3 \neq 0 \qquad x-1 \neq 0$

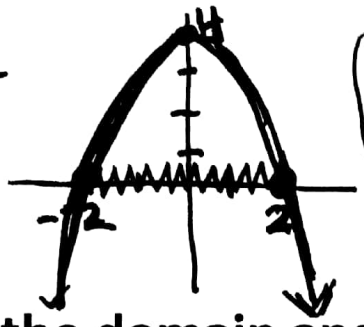
$x \neq -3 \qquad x \neq 1$



$(-\infty, -3) \cup (-3, 1) \cup (1, \infty)$

g) $k(x) = \sqrt{4 - x^2} \geq 0$

tricky quadratic under ✓ Graph Quadratic



$[-2, 2]$

Ex 2) Find the domain and the range of each function

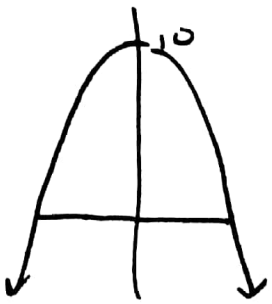
(PICTURE IT!)

a) $f(x) = x^2 + 4$

D: $(-\infty, \infty)$

R: $[4, \infty)$

b) $g(x) = 10 - x^2$



D: $(-\infty, \infty)$

R: $(-\infty, 10]$

**** discuss 25,27 on HW Worksheet**