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!**

Ex 1) Find the domain of each function

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

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

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

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

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

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

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

Ex 2) Find the domain and the range of each function (PICTURE IT!)

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

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

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

(DAY 2)

<u>Vertical Asymptotes</u>: can be found by setting unique factors In denominator = 0

At vertical asymptotes, function outputs increase or decrease without bound

<u>Horizontal Asymptotes</u>: look at the graph on GC and trace out to very small and very large values of x (end behavior) to see if the outputs approach a value. OR know the rules:

- **If Degree of Numerator = Degree of Denominator, then the HA is y=ratio of leading coefficients**
- **If Degree of Numerator< Degree of Denominator, then the HA is y=0**
- **If Degree of Numerator > Degree of Denominator, then there is NO HA (there may be a slant asymptote)**

Ex 3) Find all horizontal and vertical asymptotes for each function.

a) $f(x)=\dfrac{x}{x^2-4}$ **b)** $g(x)=\dfrac{3x-1}{x+3}$

c) $h(x)=\dfrac{x+2}{3-x}$

d) $p(x)=\dfrac{x}{x-1}$