

## Day 2 on 1.2

I. **Domain of the function:** Set of all real numbers for which the expression is defined.

Ex 1)  $f(x) = \frac{1}{x^2 - 4}$

$x^2 - 4 = 0$   
 $x^2 = 4$   
 $x = \pm 2$   
 D: all reals except  $x \neq \pm 2$

Ex 2)  $f(x) = \sqrt{x}$

D:  $x \geq 0$  or  $[0, \infty)$

Ex 3)  $f: (-3, 0), (-1, 4), (0, 2), (2, 2), (4, -1)$

D:  $\{-3, -1, 0, 2, 4\}$

Ex 4)  $h(x) = x^2 + 5x - 6$

all reals or  $(-\infty, \infty)$

Ex 5)  $t(x) = \frac{1}{x - 6}$

$(-\infty, 6) \cup (6, \infty)$   
 $(-\infty, \frac{5}{2}]$

Ex 6)  $A = \pi r^2$

$(0, \infty)$   
 $5 - 2x \geq 0$   
 $-2x \geq -5$   
 $x \leq \frac{5}{2}$   
 D:  $x \leq \frac{5}{2}$

Ex 7)  $f(x) = \sqrt{5 - 2x}$

## II. Range:

Ex 8) Graph and find the domain and range.

$f(x) = \sqrt{9 - x^2}$



D:  $[-3, 3]$  or  $-3 \leq x \leq 3$

R:  $[0, 3]$  or  $0 \leq y \leq 3$

III. Find all value(s) of  $x$  such that  $f(x) = 0$ .

Ex 9)  $f(x) = 5x + 1$

$0 = 5x + 1$   
 $-1 = 5x$   
 $-\frac{1}{5} = x$

IV. **Story Problem:** A baseball is hit at a point 3 feet above the ground at a velocity of 100 feet per second and at an angle of 45 degrees. The path of the baseball is given by the function  $f(x) = -0.0032x^2 + x + 3$  where  $y$  and  $x$  are measured in feet. Will the baseball clear a 10 foot fence located 300 feet from home plate?

$f(300) = -0.0032(300)^2 + 300 + 3$

$f(300) = 15 \text{ ft}$  Yes, it's a homerun! 😊