Mathematics 11U

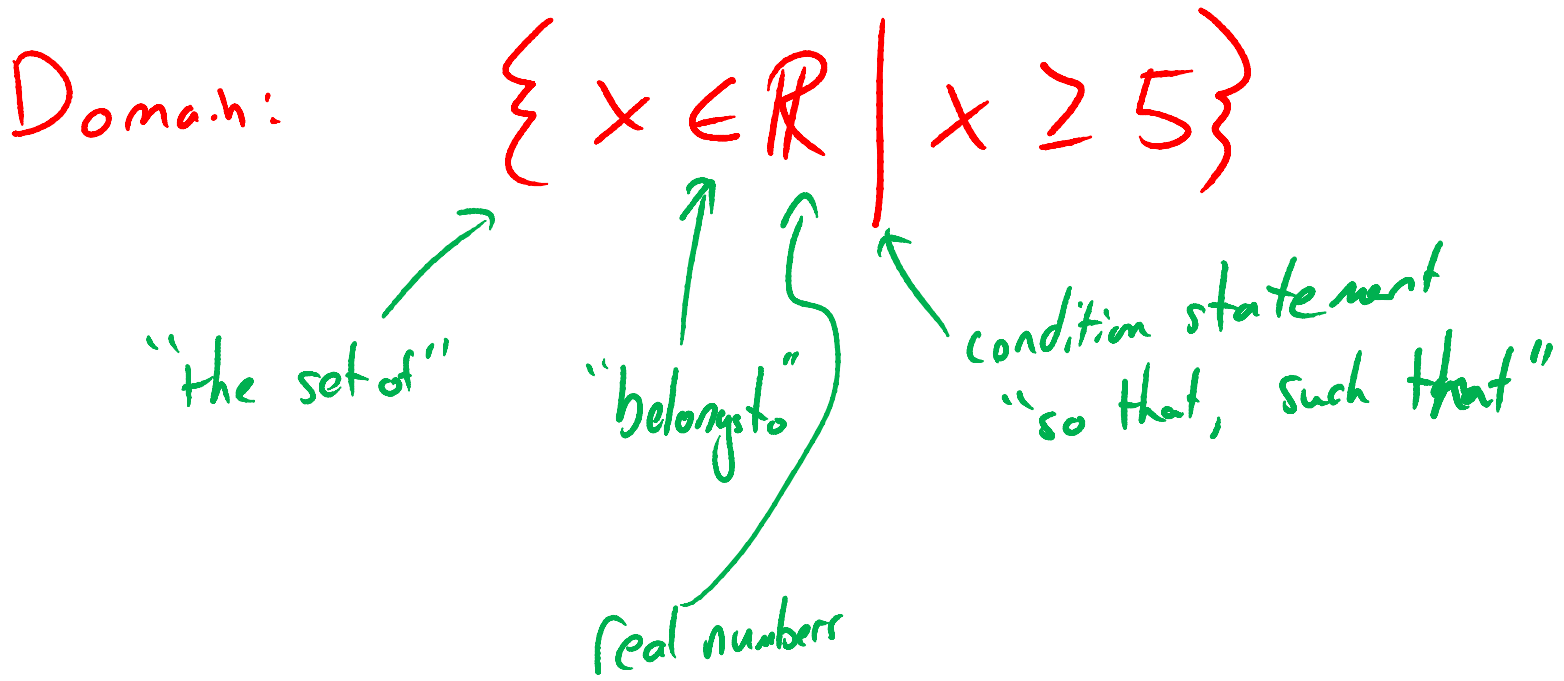
1.3 – Parent Functions

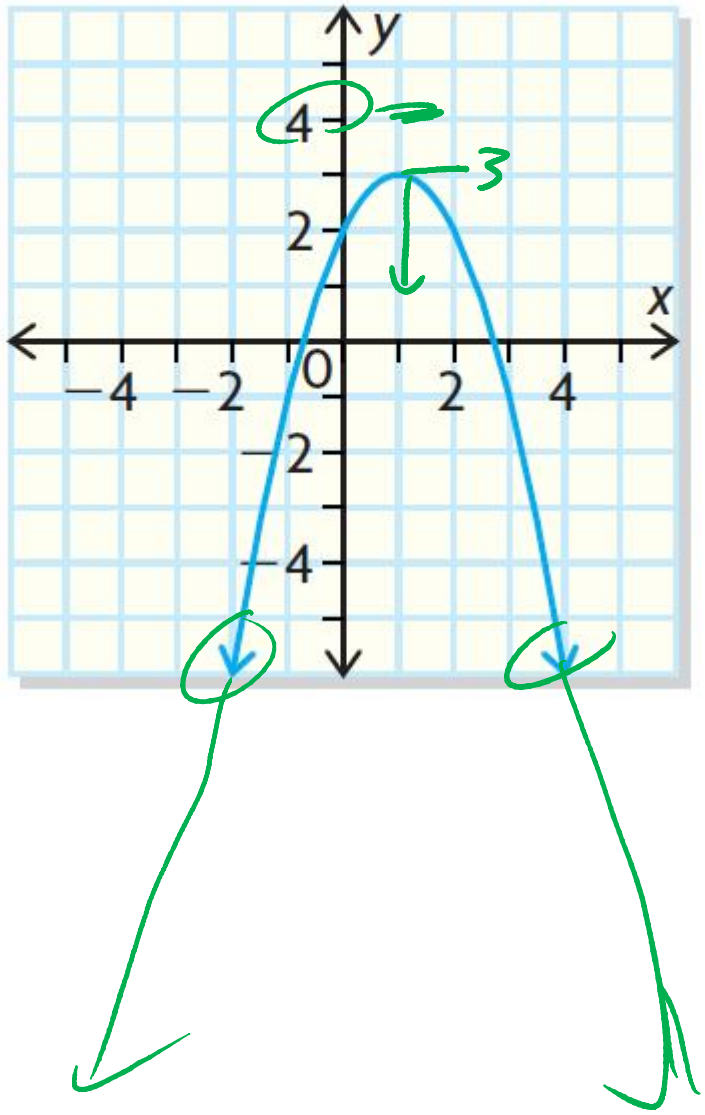
1.4 –Domain and Range Part 1

Mr. D. Hagen

- Domain: the set of all possible x-values or inputs
  - restrictions
- Range: the set of all possible y-values or outputs
  - values that cannot be produced

Fancy Schmancy Notation

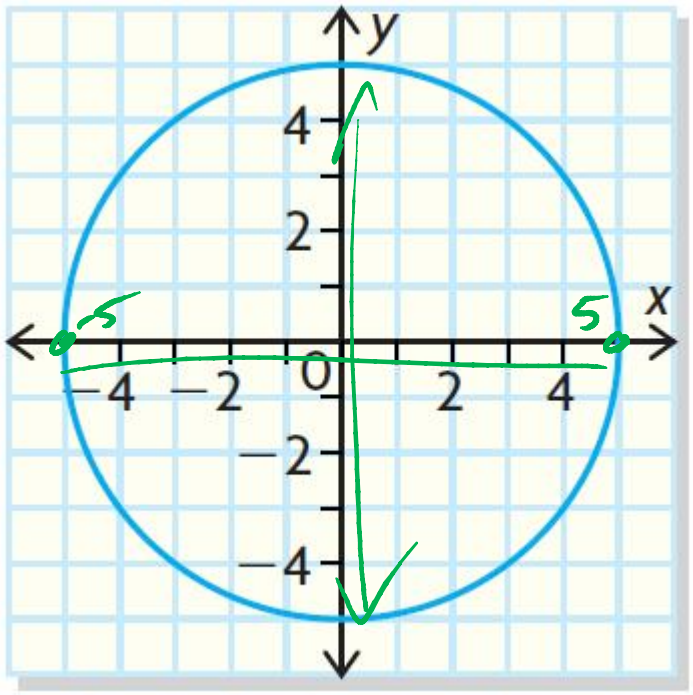




Domain: $\{x \in \mathbb{R}\}$

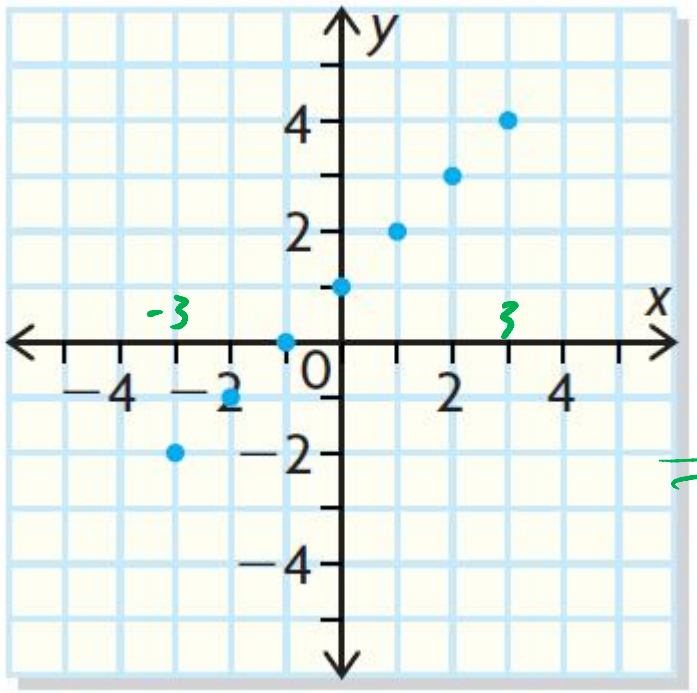
"all real numbers"

Range: $\{y \in \mathbb{R} \mid y \leq 3\}$



Domain: $\{x \in \mathbb{R} \mid -5 \leq x \leq 5\}$

Range: $\{y \in \mathbb{R} \mid -5 \leq y \leq 5\}$

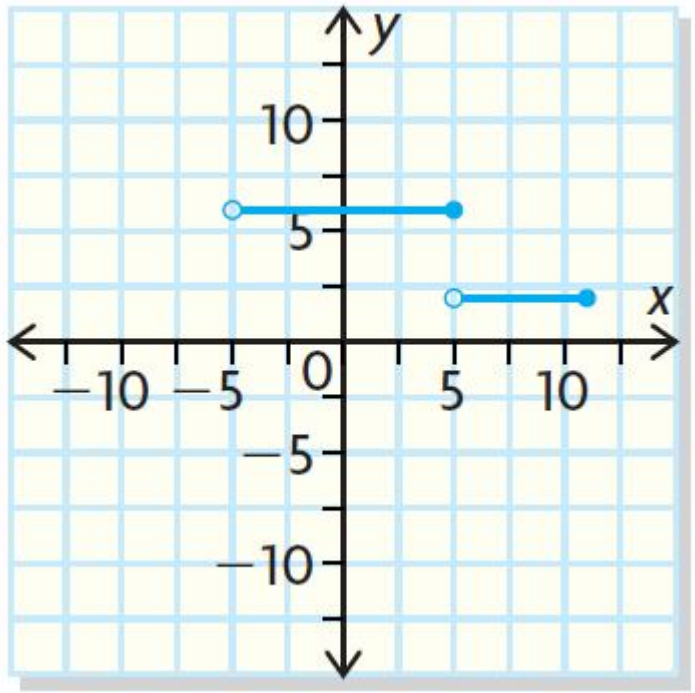


Domain $\{-3, -2, -1, 0, 1, 2, 3\}$

Range $\{-2, -1, 0, 1, 2, 3, 4\}$

Domain: $\{x \in \mathbb{Z} \mid -3 \leq x \leq 3\}$

Range: $\{y \in \mathbb{Z} \mid -2 \leq y \leq 4\}$



Domain: $\{x \in \mathbb{R} \mid -5 < x \leq 11\}$

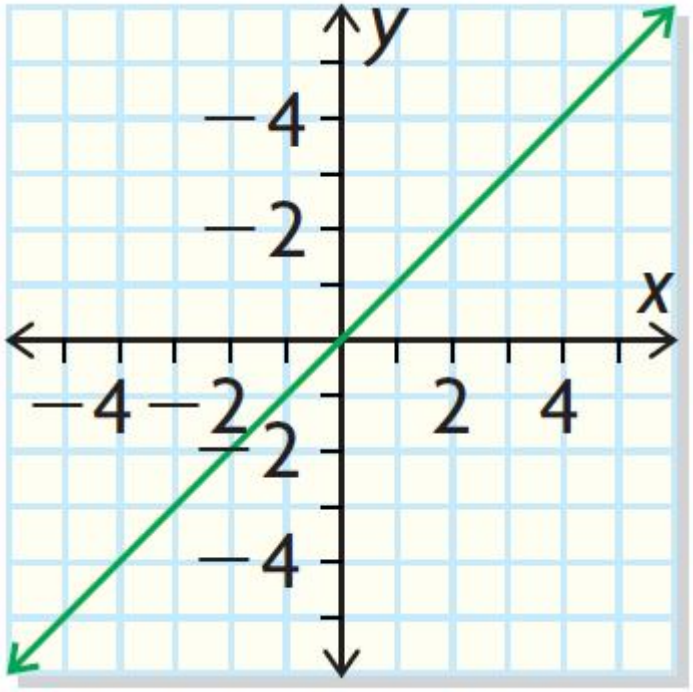
Range: $\{2, 6\}$

○ = not included or $<$ $>$

● = included or $\leq$ $\geq$

The 5 Parent Functions

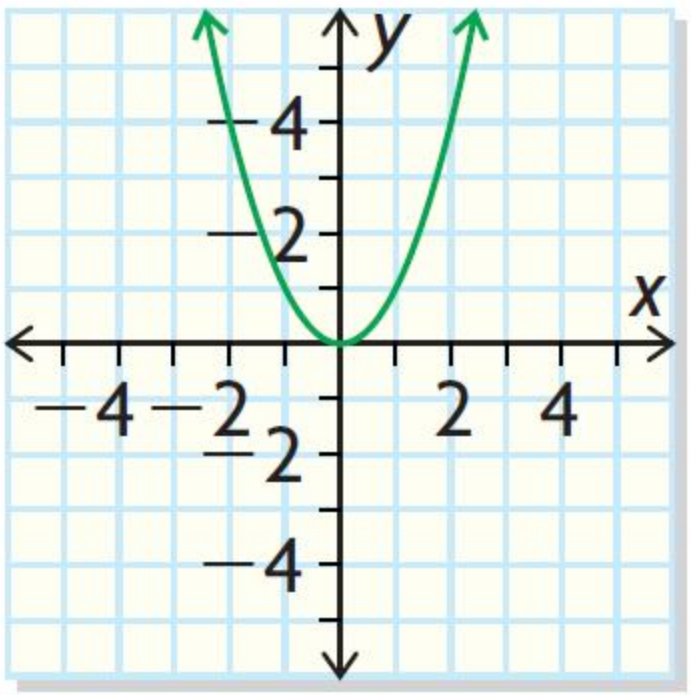
- Parent functions are the base form or stripped down version of a type of function.



1. Linear Function

$f(x) = x$

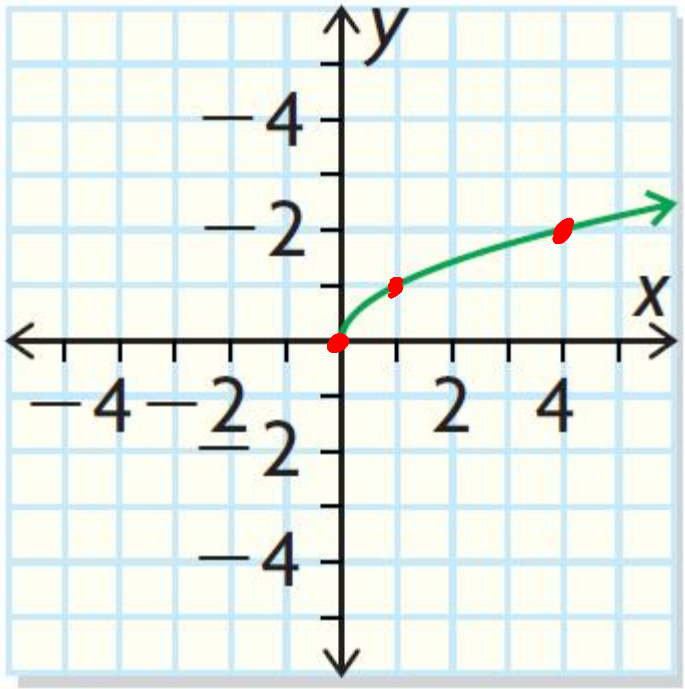
x	y
-2	-2
-1	-1
0	0
1	1
2	2



2. Quadratic Function

$f(x) = x^2$

x	$f(x)$
−2	4
−1	1
0	0
1	1
2	4

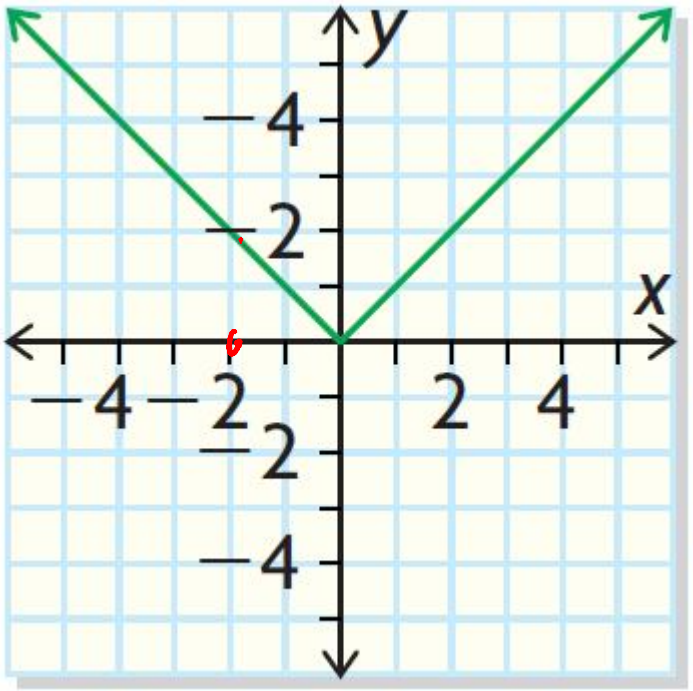


3. Square Root Function

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

- only take positive square roots.

x	$f(x)$
0	0
1	1
4	2
9	3
16	4



4. Absolute Value Function

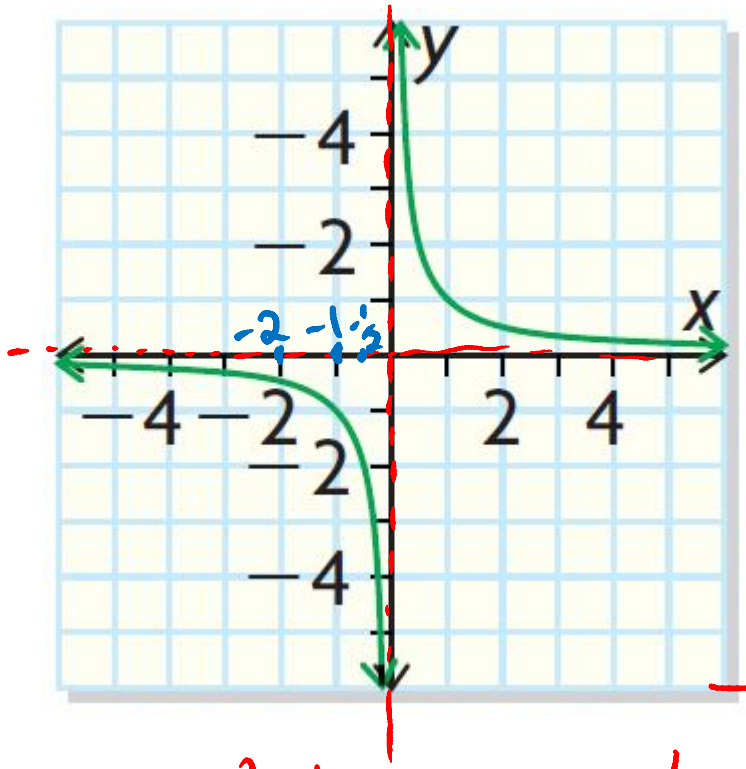
$f(x) = |x|$

x	f(x)
−2	2
−1	1
0	0
1	1
2	2

Abs Value = the distance to zero.

$|2| = 2$

$|-2| = 2$



5. Reciprocal Function

$$f(x) = \frac{1}{x}$$

x	f(x)
-2	$-\frac{1}{2}$
-1	-1
$-\frac{1}{2}$	-2
0	0
$\frac{1}{2}$	2
1	1
2	$\frac{1}{2}$

Asymptotes – a graph will continually approach and get closer to, but it will never reach it.