

1) Write a goal you would like to reach during the rest of term 1.

2) Write at least 2 things you can do to reach your goal.

2-1 Parent Functions

Objectives:

2-1a: I can identify and graph linear, absolute value, quadratic, cubic, and exponential parent functions.

2-1b: I can determine and apply attributes such as: domain, range, increasing, decreasing, max, min, and end behavior from a function.

Domain & Range

Domain: x-values input

read x's from left to right (smallest to largest)

(,) [,] (,]

*some functions have domain restrictions

can't have a neg. # in a sq. root

to find: set the radicand ≥ 0 and solve for x.

Range: y-values output

read y's from bottom to top (smallest to largest)

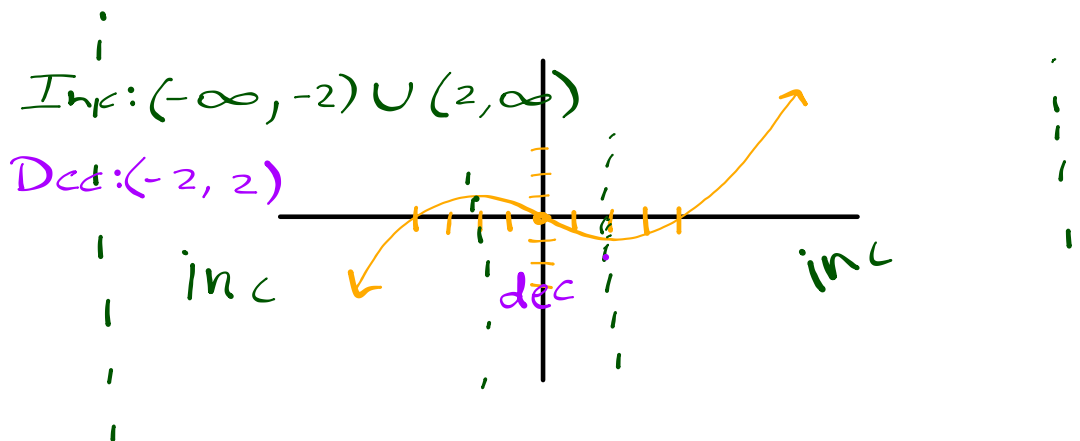
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Increasing, Decreasing and Constant

- Increasing: as you move from left to right the y-values increase
- Decreasing: as you move from left to right the y-values decrease
- Constant: as you move from left to right the y-values do not change

this behavior is reported using interval notation for the **X-VALUES** where the graph has a certain behavior

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Extrema

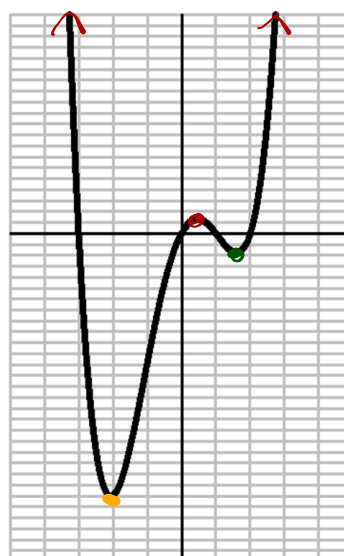
Maximums:

$(\frac{1}{2}, 1)$

Minimums:

$(-2, -\text{a lot})$ $(1.5, -2)$

Ordered Pairs!



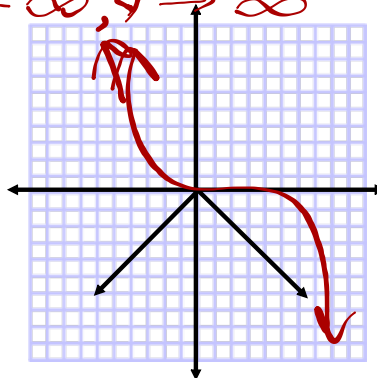
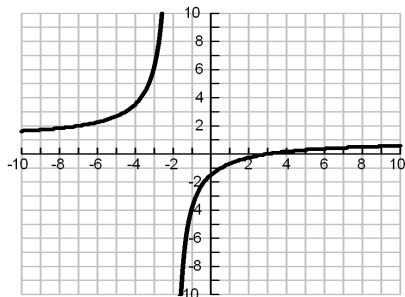
Limits

Describe end behavior:

as x approaches _____, y approaches _____

can be written as $X \rightarrow \underline{\infty}, y \rightarrow \underline{-\infty}$

$x \rightarrow -\infty, y \rightarrow \infty$



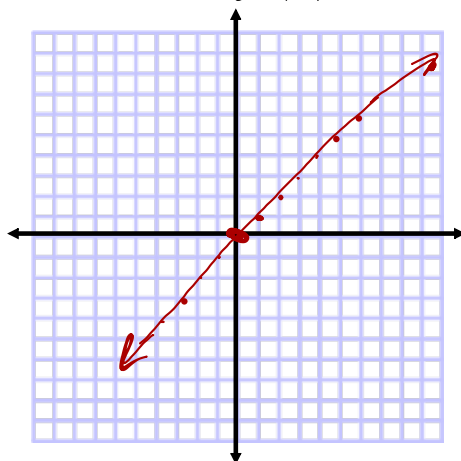
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Linear

$f(0) = 0$

x	y
0	0
1	1
2	
-1	
-2	

Equation: $f(x) = x$



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

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

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

Decreasing: none

Max: none

Min: none

Left End Behavior:

$x \rightarrow -\infty, y \rightarrow -\infty$

Right End Behavior:

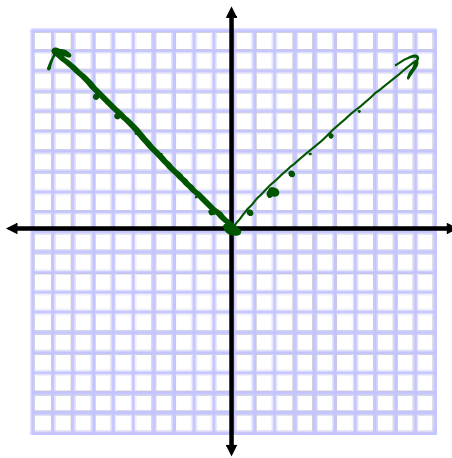
$x \rightarrow \infty, y \rightarrow \infty$

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Absolute Value

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

Equation: $f(x) = |x|$



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

Range: $[0, \infty)$

Increasing: $(0, \infty)$

Decreasing: $(-\infty, 0)$

Max: none

Min: $(0, 0)$

Left End Behavior:

$x \rightarrow -\infty, y \rightarrow \infty$

Right End Behavior:

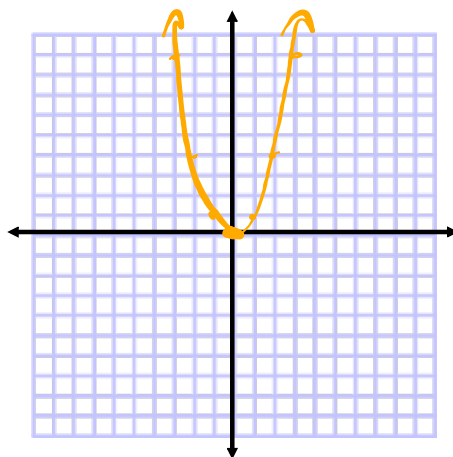
$x \rightarrow \infty, y \rightarrow \infty$

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Quadratic

x	y
0	0
1	1
2	4
-1	1
-2	

Equation: $f(x) = x^2$



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

Range: $[0, \infty)$

Increasing: $(0, \infty)$

Decreasing: $(-\infty, 0)$

Max: none

Min: $(0, 0)$

Left End Behavior:

$x \rightarrow -\infty, f(x) \rightarrow \infty$

Right End Behavior:

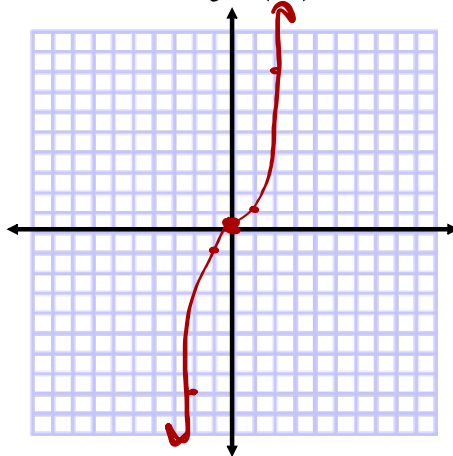
$x \rightarrow \infty, f(x) \rightarrow \infty$

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Cubic

x	y
0	0
1	1
2	8
-1	-1
-2	-8

Equation: $f(x) = x^3$



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

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

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

Decreasing: none

Max: none

Min: none

Left End Behavior:

$x \rightarrow -\infty, f(x) \rightarrow -\infty$

Right End Behavior:

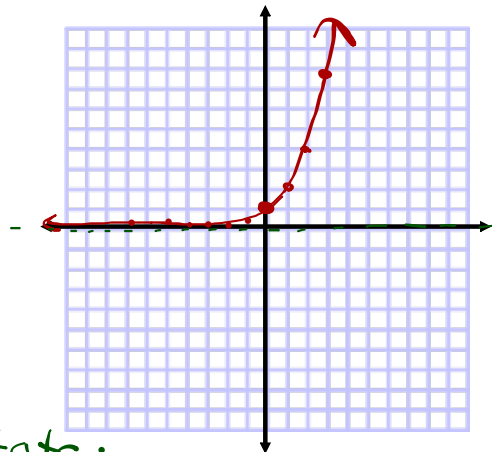
$x \rightarrow \infty, f(x) \rightarrow \infty$

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Exponential

x	y
0	1
1	2
2	4
3	8
-1	$\frac{1}{2}$

Equation: $f(x) = 2^x$



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

Range: $(0, \infty)$

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

Decreasing: none

Max: none

Min: none

Left End Behavior:

$x \rightarrow -\infty, f(x) \rightarrow 0$

Right End Behavior:

$x \rightarrow \infty, f(x) \rightarrow \infty$

asymptote:

$y = 0$

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