

# Day 7

Wednesday, September 06, 2017  
12:06 PM

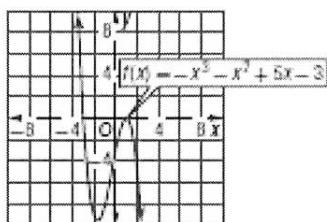
## Plan

- I. Go over homework and add names to the parent functions.
- II. <http://www.shelovesmath.com/algebra/advanced-algebra/parent-graphs-and-transformations/>  
Scroll down to see parent function chart

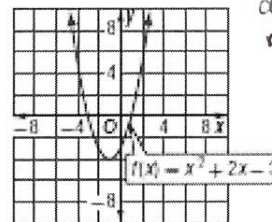
**Estimate to the nearest 0.5 unit and classify the extrema for each  $f(x)$ . Support answers numerically.**

Every block is 2 spaces

1. *rel min = (-2, -10)*  
*rel max = (1, 0)*



2.



*abs rel min = (-1, -4)*

### Standardized Test Practice

3. Find the average rate of change of  $f(x) = 3x^3 - x^2 + 5x - 3$  on the interval  $[-1, 2]$ .

- A**  $\frac{1}{8}$       **B** 8      **C** 5      **D** 24

$$\begin{aligned} f(2) &= 3(2)^3 - (2)^2 + 5(2) - 3 \\ &= 3(8) - 4 + 10 - 3 \\ &= 24 - 4 + 10 - 3 \\ &= 27 \end{aligned}$$

$$\begin{aligned} f(-1) &= 3(-1)^3 - (-1)^2 + 5(-1) - 3 \\ &= 3(-1) - 1 - 5 - 3 \\ &= -3 - 1 - 5 - 3 \\ &= -12 \end{aligned}$$

$$\frac{f(2) - f(-1)}{2 - (-1)} = \frac{27 - (-12)}{2 - (-1)} = \frac{39}{3} = 13$$

**ANSWERS**

1. Relative minimum:  $(-1.5, -9.5)$ ;  
relative maximum:  $(1, 0)$

x	-100	-2	-1.5	-1	0.5	1	1.5	100
y	$9.8 \cdot 10^5$	-9	-9.5	-8	-0.875	0	-1.125	$-1.0 \cdot 10^6$

2. Absolute minimum:  $(-1, -4)$       3. B

x	-100	-1.5	-1	-0.5	100
y	9797	-3.75	-4	-3.75	10,197

### Today's Objectives

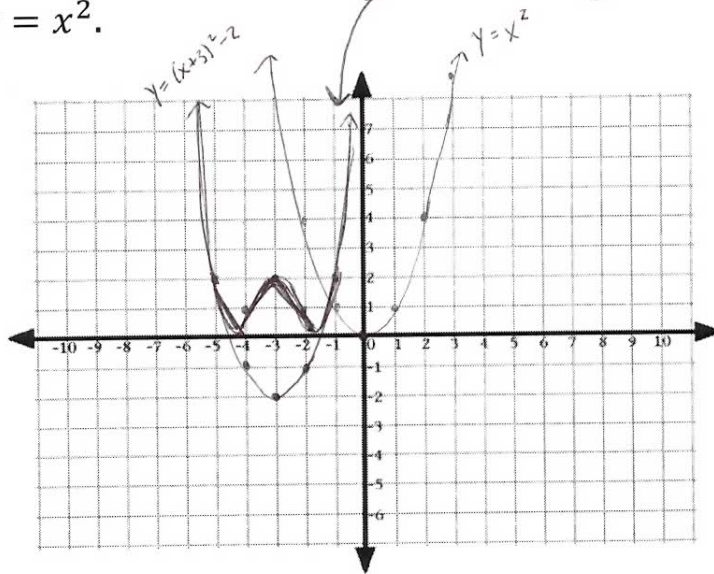
- Identify, graph, and describe parent functions.
- Identify and graph transformations of parent functions

Notes:

1. Review Transformations of Parent functions : <https://www.desmos.com/calculator/gsskcabgss>,  
Review shifts and stretches

2. Go over Absolute value transformations of  $f(x)$  including  $f(|x|)$  and  $|f(x)|$  using Desmos:  
<https://www.desmos.com/calculator/udpervqykd>

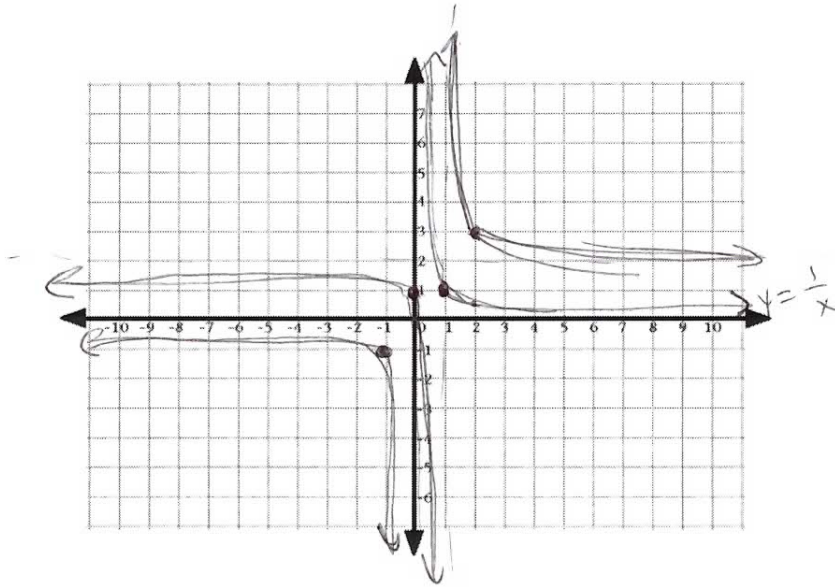
**Example 1:** Graph  $y = |(x + 3)^2 - 2|$  starting with the parent function  $y = x^2$ .



**Example 2:** Graph  $y = \frac{1}{x-1} + 2$  starting with the parent function  $y = \frac{1}{x}$ .

$$y = \frac{1}{x}$$

x	y
0	und.
1	1
2	$\frac{1}{2}$



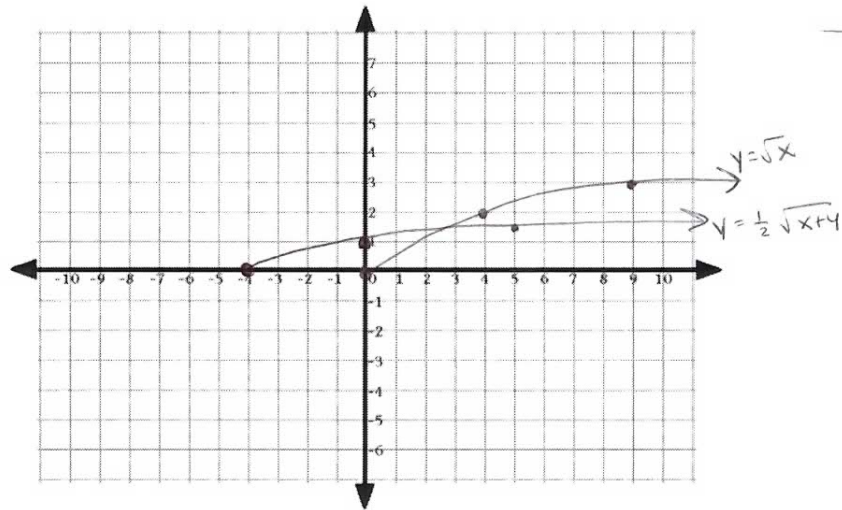
$$y = \frac{1}{x-1} + 2$$

x	y
1	und.
2	3

**Example 3:** Graph  $y = \frac{1}{2}\sqrt{x+4}$  starting with the parent function  $y = \sqrt{x}$ .

$$y = \sqrt{x}$$

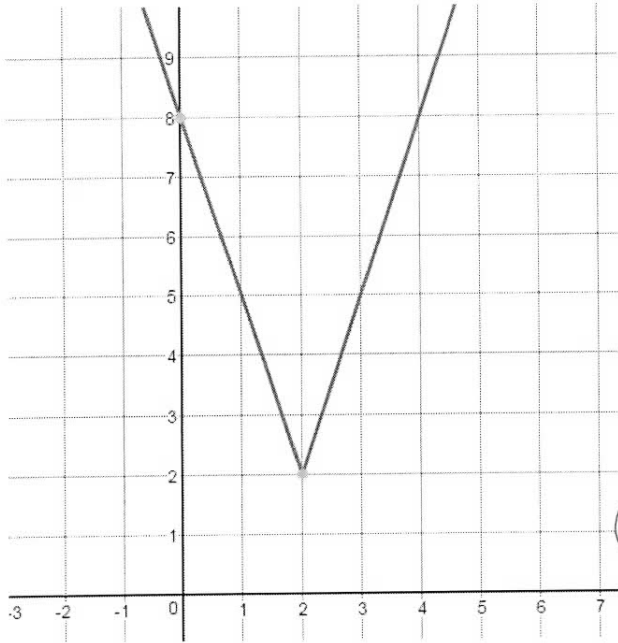
x	y
0	0
4	2
9	3



$$y = \frac{1}{2}\sqrt{x+4}$$

x	y
-4	0
0	1
5	$\frac{3}{2}$

**Example 4:** Write the **absolute value** equations for the graphs below.



$$y = a|x-2| + 2$$

$$8 = a|0-2| + 2$$

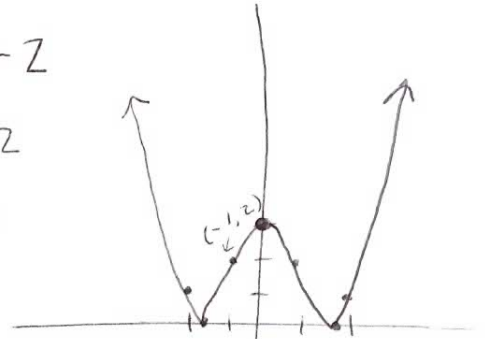
$$8 = a|2| + 2$$

$$8 = 2a + 2$$

$$6 = 2a$$

$$3 = a$$

$$y = 3|x-2| + 2$$



$$y = |x^2 - 3|$$

no shift left or right

$y = a|x^2 - 3|$   
 $2 = a|(-1)^2 - 3|$      $\downarrow$  down 3  
 $2 = a|1 - 3|$         but was  
 $2 = a|-2|$             reflected  
 $2 = -2a$               up b/c  
 $a = -1$                 of | |

Short Quiz tomorrow: Name and sketch each of the parent functions without a calculator. I will give you the equations.

Example:  $y = x$       function name linear

