Use this Quadratic Function $f(x) = 2x^2 - 3x + c$

This quadratic passes through the point (-1,13). Find c.

x y

$13 = 2(-1)^2 - 3(-1) + c$

$13 = 2(1) - 3(-1) + c$

$13 = 2 + 3 + c$

$13 = 5 + c$

$-5 \quad -5$

$\boxed{c = 8}$

Find the quadratic function $y = ax^2 + c$ that passes through the given points:

(2, -9) and (-3, -34)

x y x y

$-9 = 4a + c$

$-34 = 9a + c$

To find the values of a & c you now solve this system of equations using Elimination, substitution or matrices

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You can now finish Hwk #17.

Use the sheet I've printed out.

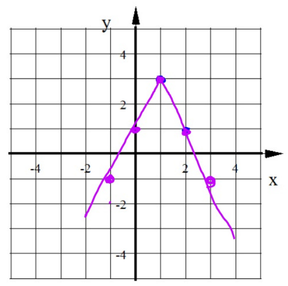
Describe the transformations this Absolute Value function represents compared to the parent function.

$y = -2|x - 1| + 3$

1RT 3up

-2	− up side down 2 twice as tall
x - 1	1 RT
+3	3 up

Graph



$$y = a|x - h| + k$$

a = Vertical Stretch/Shrink Factor

a>0	a<0	a>1	0<a<1
opens up	opens down	taller	shorter

h: Horizontal Translation

Vertex: (h,k)

k: Vertical Translation

When a graph is flipped upside down it is also known as an

x-axis Reflection

$$y = a|x - h| + k$$

A graph is flipped over the x-axis when a < 0

When a graph is flipped backwards it is also known as a

y-axis Reflection

We won't do a y-axis reflection on Absolute Value or Quadratic functions. WHY?

Both of these graphs are already symmetrical about the y-axis

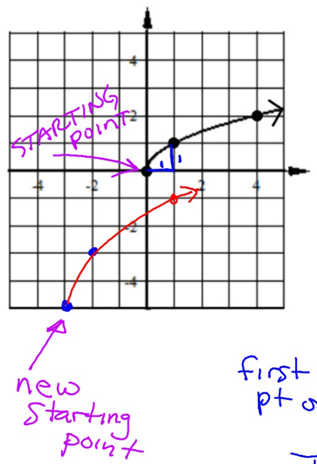
In general, if the function y = f(x) is transformed the following way:

y = a f(x - h) + k

The parent function has been:

- Streched/Shrunk vertically by a factor of a
- Reflected over x-axis if a<0
- Translated horizontally h units.
- Translated vertically k units.

Use the graph of the parent function $y = \sqrt{x}$ shown below to graph $y = 2\sqrt{x+3} - 5$



new starting point

2 ➞ • V. Stretch factor of 2
(twice as tall)
• Not Upside down

x+3 ➞ 3 left

- 5 ➞ 5 down

Starting Point: (-3, -5)

first good pt on orig

first good pt on new graph

2nd good pt on orig

2nd good pt on new graph

Section 5-3:

Transforming Parabolas

$$y = a(x-h)^2 + k$$

a = Vertical Stretch/Shrink Factor

a>0 opens up | a<0 opens down | a>1 taller | 0<a<1 short

h: Horizontal Translation

k: Vertical Translation

Vertex: (h,k)

$$y = ax^2 + bx + c$$

Standard Form of a Quadratic Function

$$y = a(x-h)^2 + k$$

Vertex Form of a Quadratic Function

Describe the transformations shown in the equation and identify the vertex and the y-intercept of this quadratic:

$$y = -3(x + 2)^2 + 7$$

2 left   7 up

Vertex $(-2, 7)$

opens down

3x taller (vertical stretch factor)

Graph this quadratic using five points

$y = -3(x + 2)^2 + 7$ 2 left   7 up

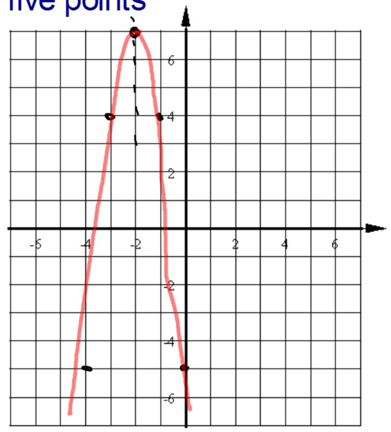
Vertex $(-2, 7)$

first good pt

1 | 1 x -3 → 1 | -3

2nd good point

2 | 4 x -3 → 2 | 12



Graph this quadratic using five points

$y = 2(x - 3)^2 - 5$ 3 rt   5 down

Vertex $(3, -5)$

first good pt

1 | 1 x2 → 1 | 2

2nd good point

2 | 4 x2 → 2 | 8