These panels answer questions 5-7 from the homework.

Topic 3: Transforming Functions

Answer Questions 8 & 9 on SAS2

Answers on Agilemind-Topic 3 -Exploring page 5

The graph of $y = ax^2 + c$

Topic 3: Transforming Functions

Answer Question #10 on SAS2

$$y = ax^2 + c$$

a - value:

If a>0 graph is like the parent function - Opens Up
If a<0 graph is upside down (x-axis reflection) - Opens Down
If |a|>1 graph is taller (narrower) than the Parent Function
If |a|<1 graph is shorter (wider) than the Parent Function

$$y = ax^2 + c$$

c - value:

If c>0 then the graph moves up c units
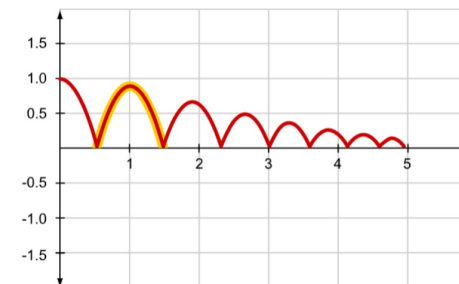If c<0 then the graph moves down c units

Topic 3: Transforming Functions

Answer Question #11 on SAS2

Answers on Agilemind website-Topic 3 -Exploring page 7

Topic 3: Transforming Functions

Answer Question #12 on SAS2

Answers on Agilemind website-Topic 3 - Exploring page 8

Agilemind website-Topic 3 -Exploring page 9 & 10

Topic 3: Transforming Functions

Answer Question #15 on SAS2

Use sliders on Agilemind website-Topic 3 -Exploring page 10
to see what changing the value of h does to the graph.

15. How does the graph of $y = (x - h)^2$ compare to the graph of $y = x^2$?

When h is positive, the graph moves h units to the right.

When h is negative, the graph moves |h| units to the left.

To Summarize:

$(x - h)$ moves the graph h units right

and

$(x + h)$ moves the graph h units left

Panel 1 (top-left)

Topic 3: Transforming Functions
Answer Question #16 on SAS2

3 right

16. **REINFORCE** Graph the function $f(x) = (x - 3)^2$. How does this graph compare to the graph of the parent function $y = x^2$?

This equation shows that the graph shifted 3 units right and is just as tall as the parent function and still opens upward, just like the parent function.

Therefore, the vertex is (3,0). The first point to the right is still 1 unit right and 1 unit up. The second point to the right is 2 units right and 4 units up.   Reflecting these two points over the Line of Symmetry, vertical line through the vertex, gives the two points to the left of the vertex.

Panel 2 (top-right)

Panel 3 (bottom-left)
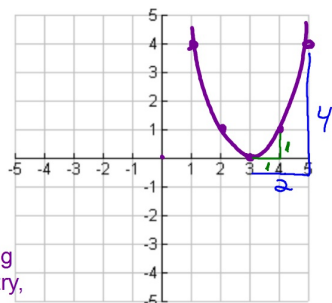
Vertex Form of a Quadratic Equation:

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

Vertex: (h,k)

Panel 4 (bottom-right)

Write the equation of the quadratic function shown in Vertex Form and describe the transformation from the parent function $y = x^2$.
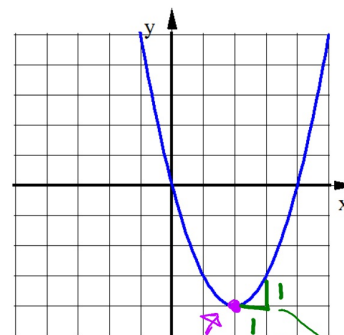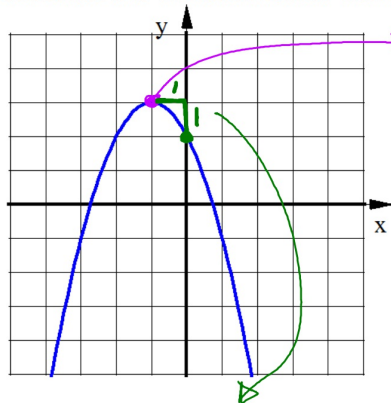
$$y = a(x - h)^2 + k$$
$$y = a(x - 2)^2 + {-4}$$
$$y = a(x - 2)^2 - 4$$
$$y = (x - 2)^2 - 4$$

$(2, -4)$

h k

Since this graph opens up like the parent function **a** must be positive. On the parent function the first point to the right of the vertex was 1 unit right and 1 unit up. On this fuction it is also 1 unit right and 1 unit up, therefore, this function is just as tall as the parent function, therefore, a= 1

Write the equation of the quadratic function shown in Vertex Form and describe the transformation from the parent function $y = x^2$.

$(-1, 3)$

$h = -1$ $k = 3$

$y = a(x-h)^2 + k$
$= a(x - -1)^2 + 3$

$y = a(x+1)^2 + 3$

$y = -(x+1)^2 + 3$

Since this graph is upside down **a** must be negative. On the parent function the first point to the right of the vertex was 1 unit right and 1 unit up. On this fuction it is 1 unit right and 1 unit down, therefore, this function is just as tall as the parent function but an x-axis reflection, therefore, **a=-1**

Write the equation of the quadratic function shown in Vertex Form and describe the transformation from the parent function $y = x^2$.
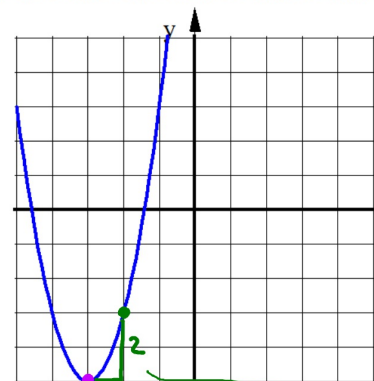
$y = a(x-h)^2 + k$
$= a(x - -3)^2 + -5$

$y = 2(x+3)^2 - 5$

vertex $(-3, -5)$

h k

On the parent function the first point to the right of the vertex was 1 unit right and 1 unit up. On this fuction it is 1 unit right and 2 units up, therefore, this function is twice as tall as the parent function: **a=2**

Hwk #14

Agilemind - Topic 3 - Transforming functions

SAS2 #18 a-c   (pay attention to scales on axes)

and   (if you can't see the graph clearly then look at the pdf on the Agilemind website)

More Practice pages 1-3   (Agilemind website)