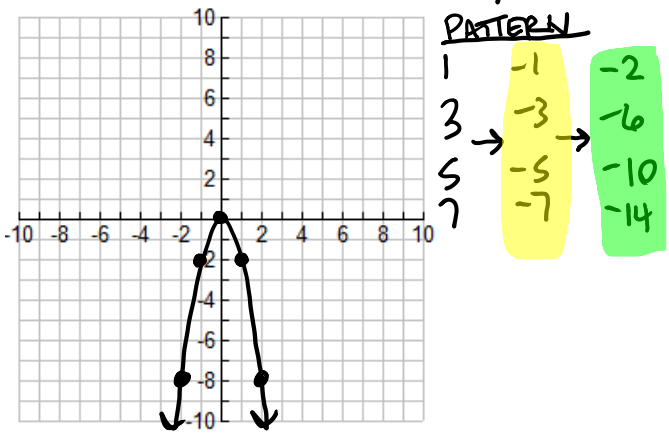
Unit 8 Day 2 Notes on more Graphing (Stretches & Shrinks, Reflections & Vertical Shifts) Key

WARM IT UP!
Describe the transformations being performed on the parent function. Then, graph the new function.

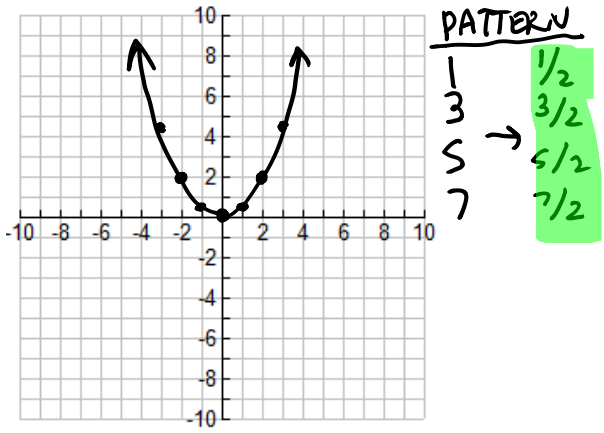
1. $y = -2x^2$

reflect over x-axis
vert. stretch by 2



2. $y = \frac{1}{2}x^2$

vert. shrink by $\frac{1}{2}$



THINK BACK!
How were the following absolute value functions transformed?

3. $y = |x| - 5$

down 5

4. $y = |x| + 3$

up 3

5. $y = -|x| - 2$

reflect over x-axis
AND
down 2

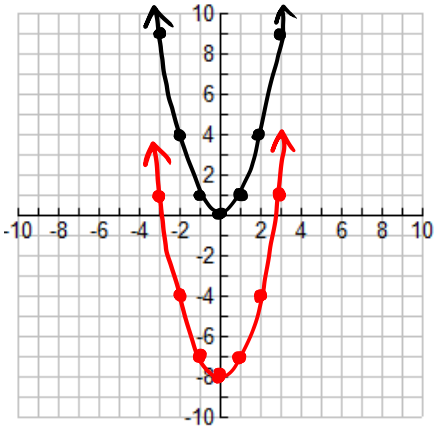
Can you make a *prediction* about what the graph of $y = x^2 - 4$ would look like?

down 4 from the parent function $y = x^2$

Graph the quadratic parent function $y = x^2$ on each graph below. Then, complete the table and sketch the graph of the function noted.

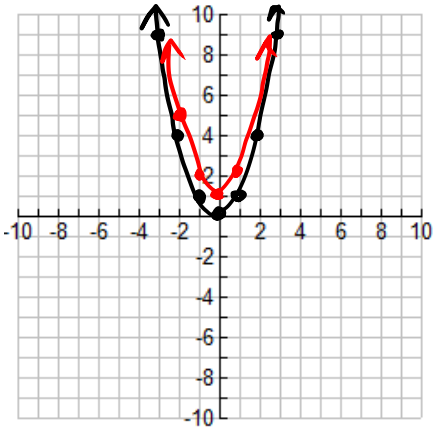
6. $y = x^2 - 8$

x	y
-2	-4
-1	-7
0	-8
1	-7
2	-4



7. $y = x^2 + 1$

x	y
-2	5
-1	2
0	1
1	2
2	5



Observations? *What did you notice about the pattern?*

Graphs shifted up/down while the 1, 3, 5, ... pattern stayed the same.

CAN YOU BRING IT TOGETHER?

Describe the transformations of the following quadratic functions:

8. $y = 5x^2 - 3$

① vert. stretch by 5

② down 3

9. $y = -x^2 + 2$

① reflection over x-axis

② up 2

10. $y = -\frac{1}{7}x^2 + 5$

① reflection over x-axis

② vert. shrink by 1/7

③ up 5

Does order matter? Intuitively … what do you think comes first??

Yes, think order of operations!

① REFLECTIONS

② STRETCHES/SHRINKS

③ SHIFTS UP/DOWN

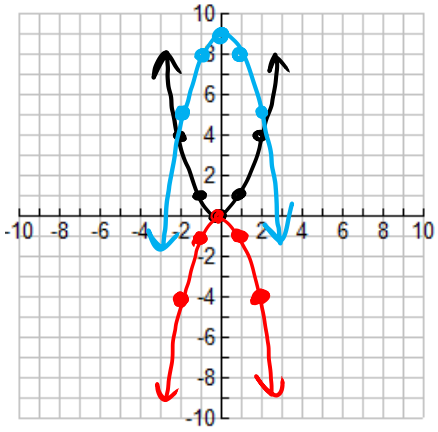
LET'S GRAPH!

Describe the transformations being performed on the parent function. Then, graph the new function.

11. $y = -x^2 + 9$

① reflection over x-axis

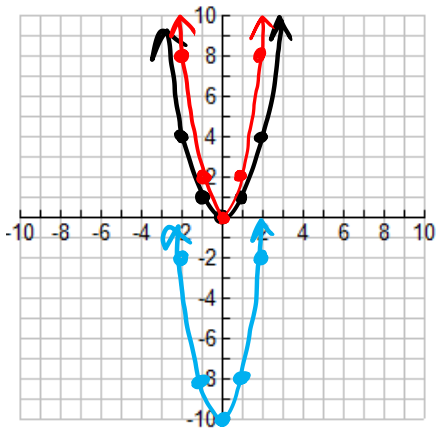
② up 9



12. $y = 2x^2 - 10$

① vert. stretch by 2

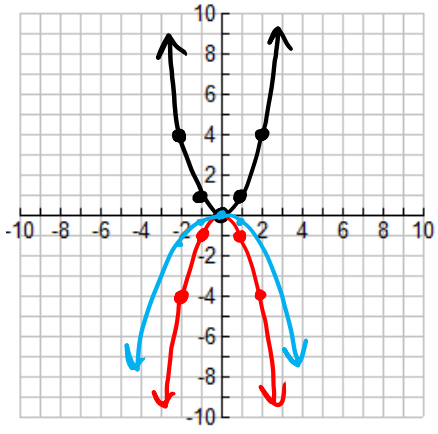
② down 10



13. $y = -\frac{1}{3}x^2$

① reflection over x-axis

② vert. shrink by 1/3

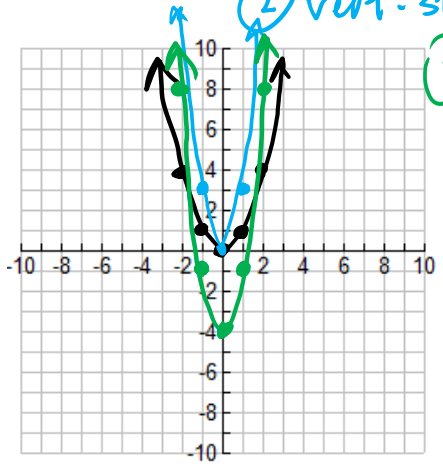


14. $y = 3(-x)^2 - 4$

① reflection over y-axis (no change)

② vert. stretch by 3

③ down 4



LAST THING!

Write an equation of a quadratic function that has been reflected over the x-axis, vertically stretched by a factor of 6 and then shifted up 17.

$y = -6x^2 + 17$