

STRETCHING / REFLECTING QUADRATIC RELATIONS



LEARNING GOALS

- Examine the effect of the parameter “a” in the equation $y = ax^2$ on the graph of the equation.



MINDS ON ...

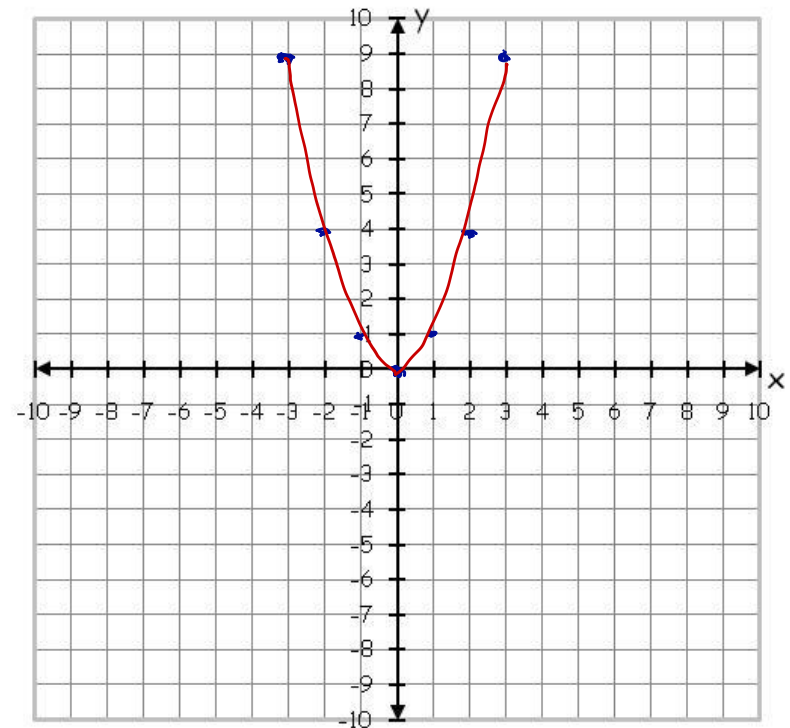
- What would the easiest parabola look like?

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

$$y = 1x^2$$
$$y = x^2$$

$$a = 1$$
$$b = c = 0$$

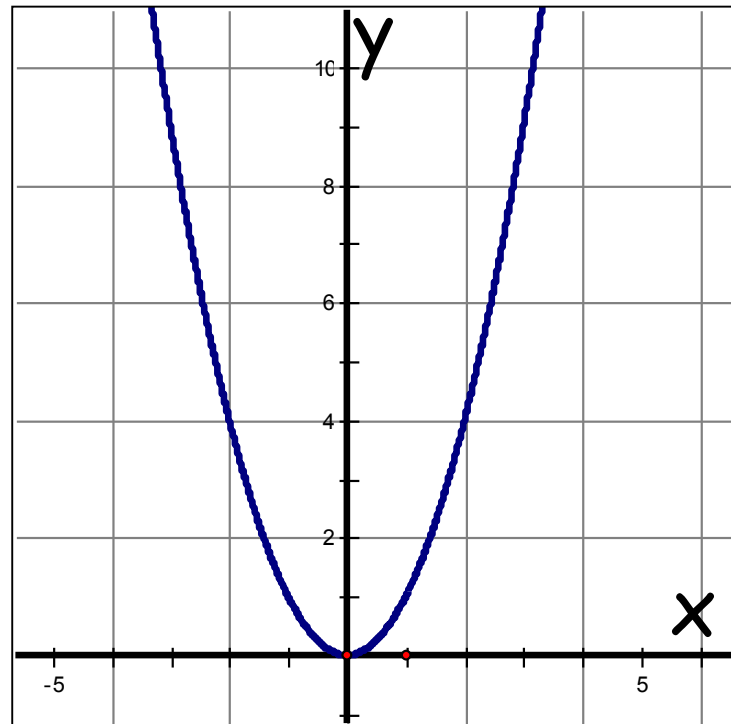
x	y
-3	9
-2	4
-1	1
0	0
1	1
2	4
3	9



BIG IDEAS

- The base curve of a parabola is given by $y = x^2$.

x	y
-3	9
-2	4
-1	1
0	0
1	1
2	4
3	9



MORE MINDS ON ...

- What if we want to change the parabola's direction?
- What if we want to make the parabola thinner or wider?



MORE BIG IDEAS

▪ TRANSFORMATIONS

▪ Reflections

- If $a > 0$ (positive), the parabola opens up.
- If $a < 0$ (negative), the parabola opens down.

▪ Dilatation

- If $|a| > 1$, the parabola is stretched vertically.
- If $0 < |a| < 1$, the parabola is compressed vertically.

Normal

→ reflected
in the
x-axis

$| |$ → absolute value
- always positive
- how far away from zero

$| -1 | = 1$
 $| -2 | = 2$
 $| 2 | = 2$



CONSOLIDATION

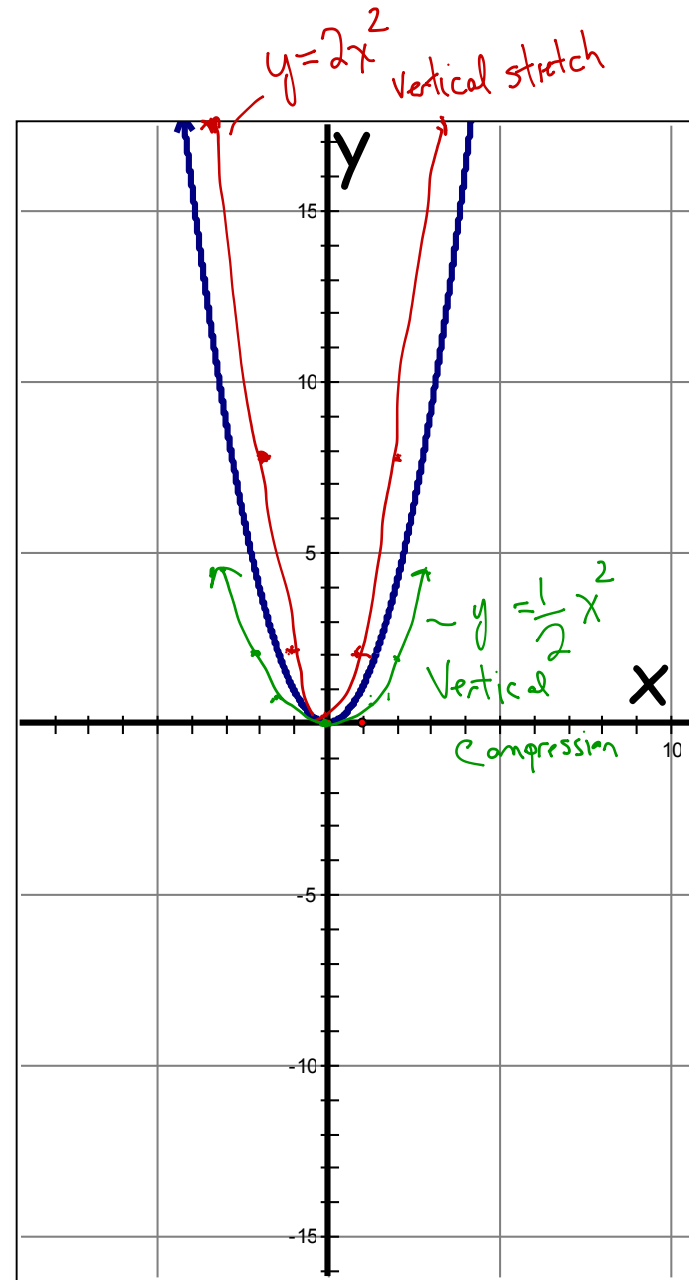
- We make a difference!

$$y = 2x^2$$

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

x	y
-3	9
-2	4
-1	1
0	0
1	1
2	4
3	9

x	y
-3	18
-2	20
-1	2
0	0
1	2
2	8
3	18



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

x	y
-3	4.5
-2	2
-1	0.5
0	0
1	0.5
2	2
3	4.5

REINFORCEMENT

- Pages 256 – 258
 - #1, 2, 4abd, 7, 11

