Graphing Quadratic Functions (a ≠ 1)

Name _____

Date _____ Period _____

How does a affect the graph of $y = ax^2$

$y = x^2$, $a = 1$

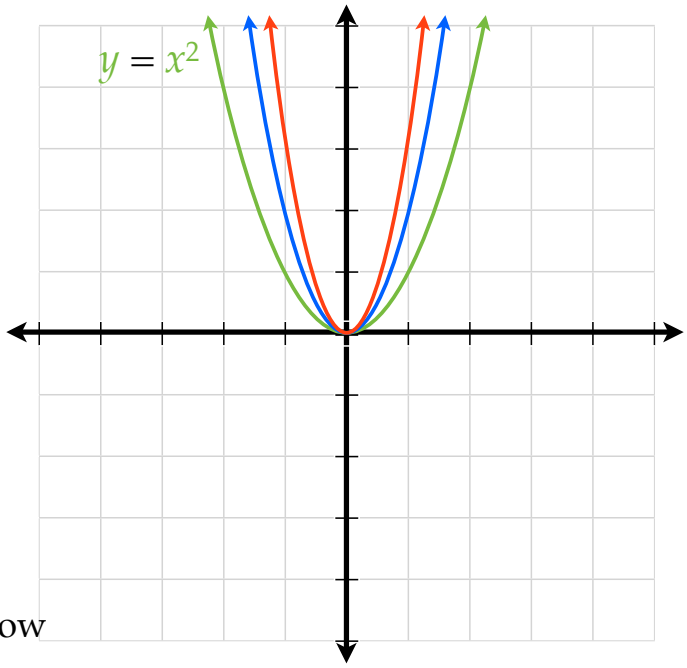
x	y
-2	4
-1	1
0	0
1	1
2	4

$y = 2x^2$, $a = 2$

x	y
-2	8
-1	2
0	0
1	2
2	8

$y = 3x^2$, $a = 3$

x	y
-2	12
-1	3
0	0
1	3
2	12



As a increases, the parabola gets more narrow

How does a affect the graph of $y = ax^2$

$y = x^2$, $a = 1$

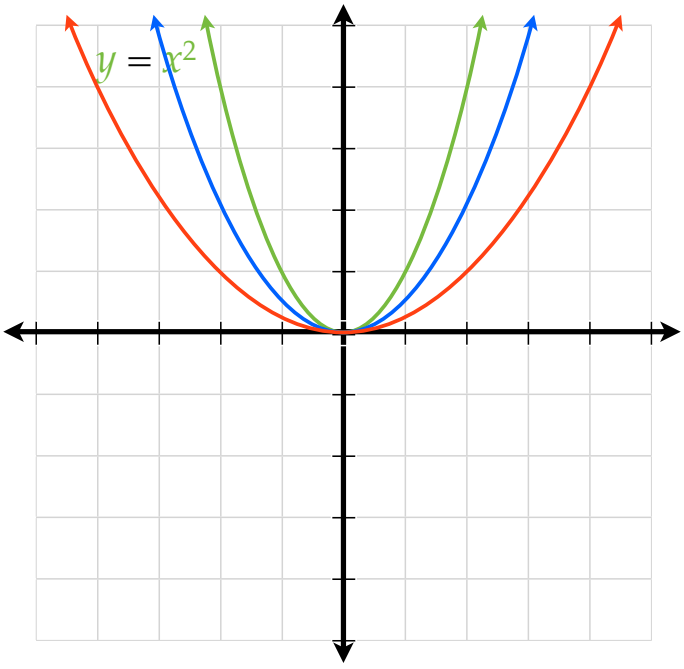
x	y
-2	4
-1	1
0	0
1	1
2	4

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

x	y
-2	2
-1	$\frac{1}{2}$
0	0
1	$\frac{1}{2}$
2	2

$y = \frac{1}{4}x^2$, $a = \frac{1}{4}$

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



As a decreases (between 0 and 1), the parabola gets wider

How does a affect the graph of $y = ax^2$

$y = x^2$

$a = 1$

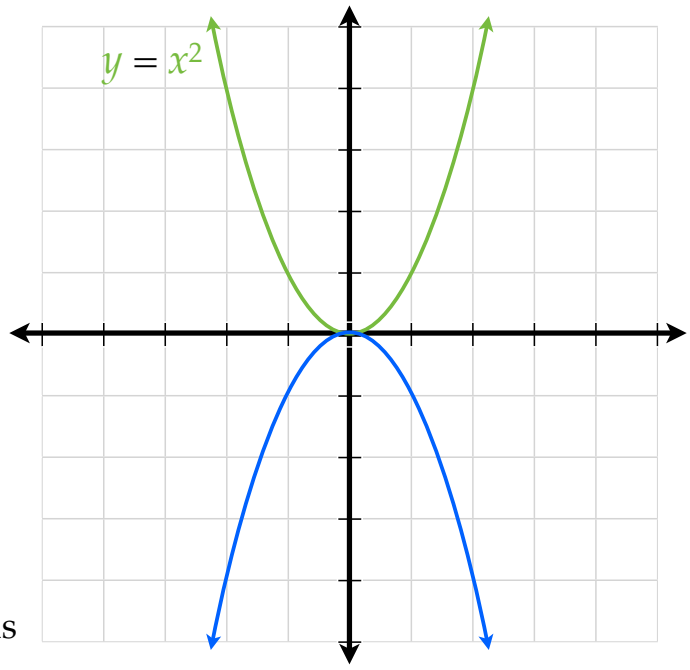
x	y
-2	4
-1	1
0	0
1	1
2	4

$y = -x^2$

$a = -1$

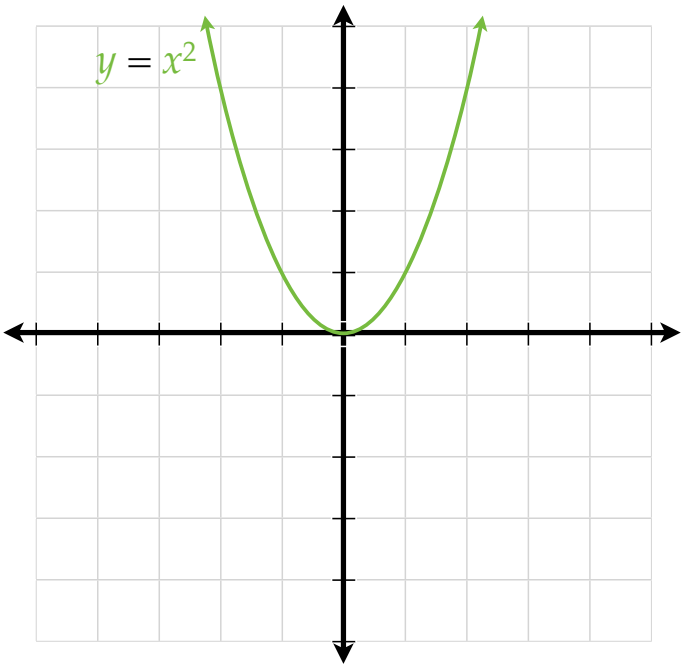
x	y
-2	-4
-1	-1
0	0
1	-1
2	-4

If a is negative, parabola reflects over x-axis



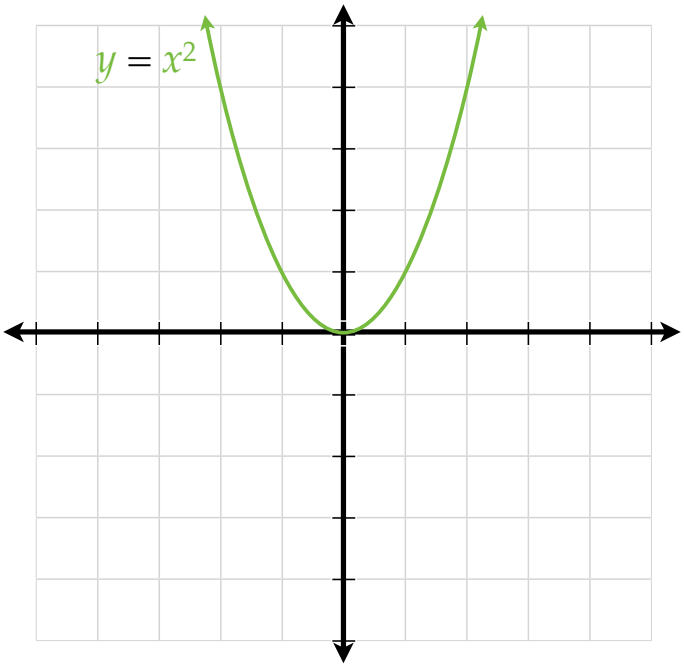
How does the value of a affect the graph

$y = -2x^2$



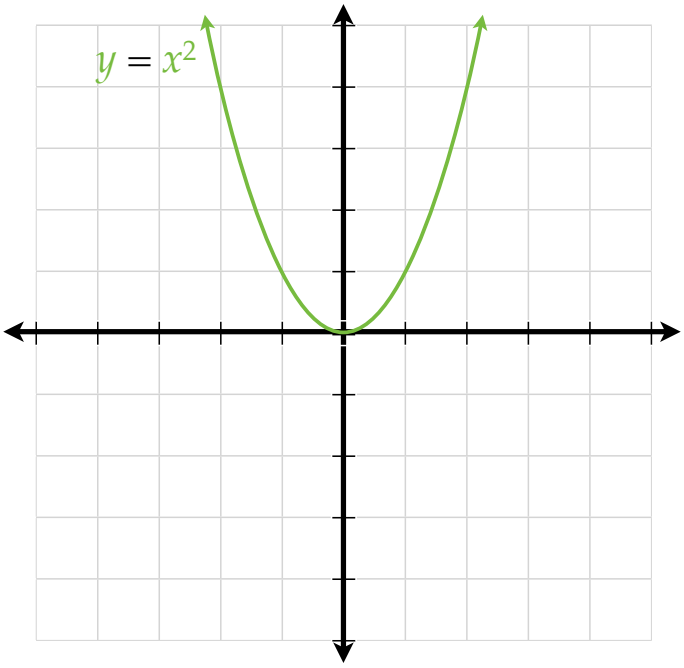
How does the value of a affect the graph

$y = 5x^2$

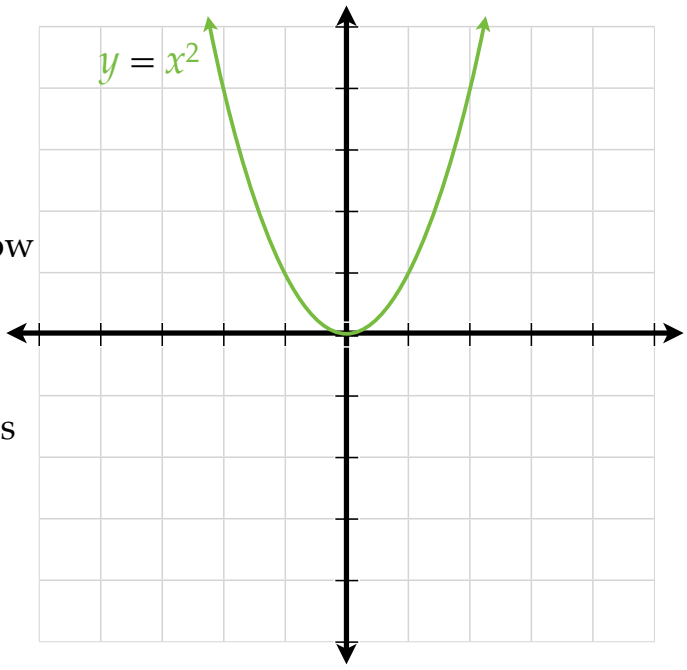


How does the value of a affect the graph

$y = -\frac{1}{5}x^2$



How does the value of a affect the graph



As a increases, the parabola gets more narrow

As a decreases (between 0 and 1), the parabola gets wider

If a is negative, parabola reflects over x-axis