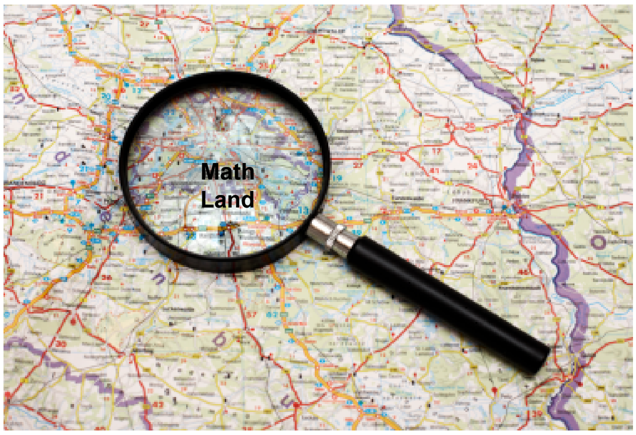
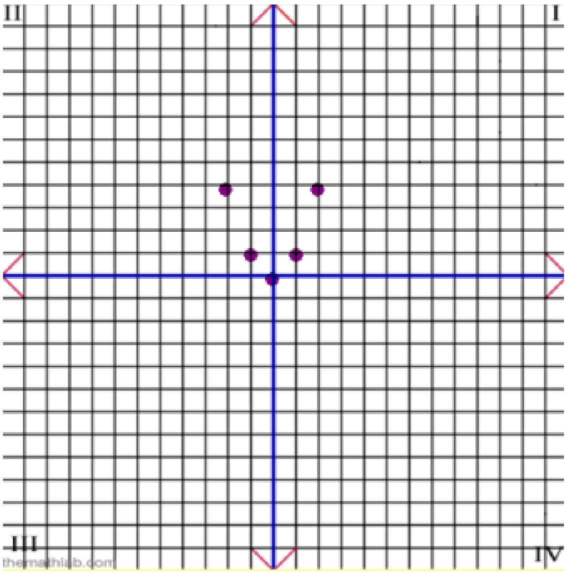
Mapping



$$y=x^2$$

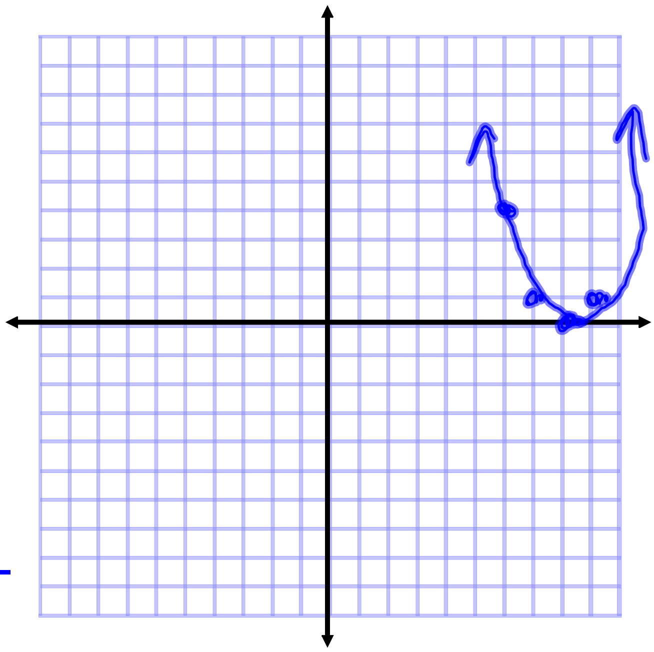
$y=1(x+0)^2+0$

All **QUADRATIC** functions originate from $\mathbf{y=x^2}$.



$y=(x-8)^2$

$y = 1(x-8)^2 + 0$



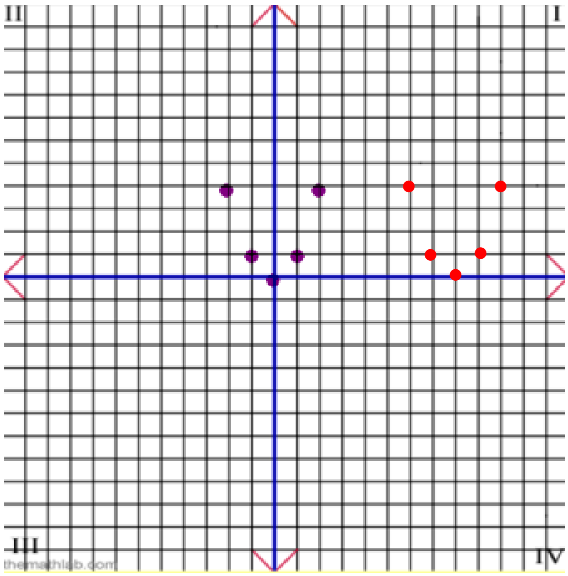
Vertex: $(8,0)$

S.F: 1

Direction: Up

Let's compare....

The graph has shifted along the x-axis.
"positive 8" units



Mapping Rule:

$(x,y) \rightarrow (x+8,\ y)$

This shows the vertex has shifted along the x-axis a postive 8 units.

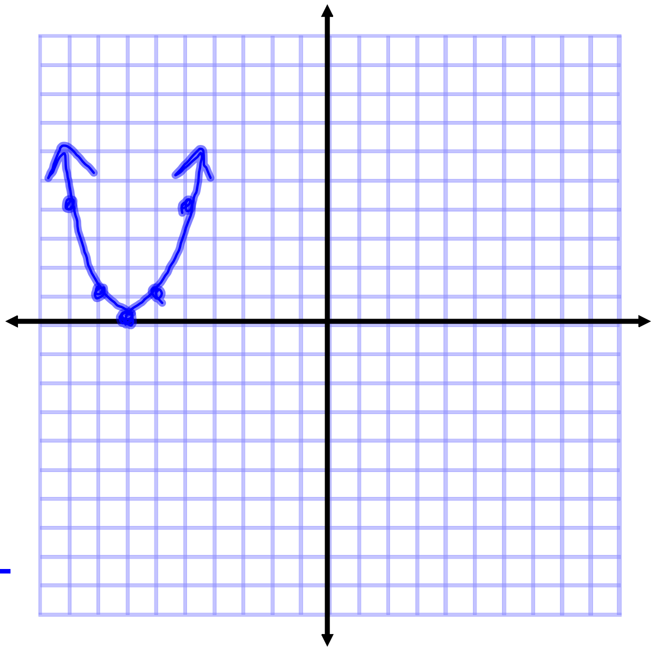
$$y=(x+7)^2$$

$y=1(x+7)^2+0$

Vertex: $(-7,0)$

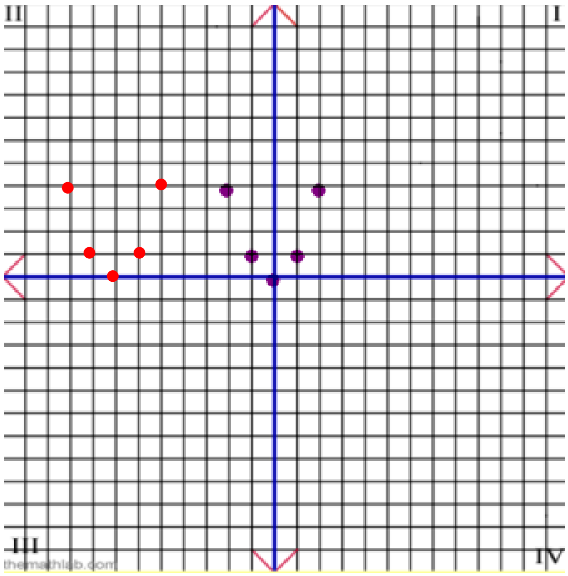
S.F: 1

Direction: up



Let's compare....

The graph has shifted along the x-axis. "negative 7" units



Mapping Rule:

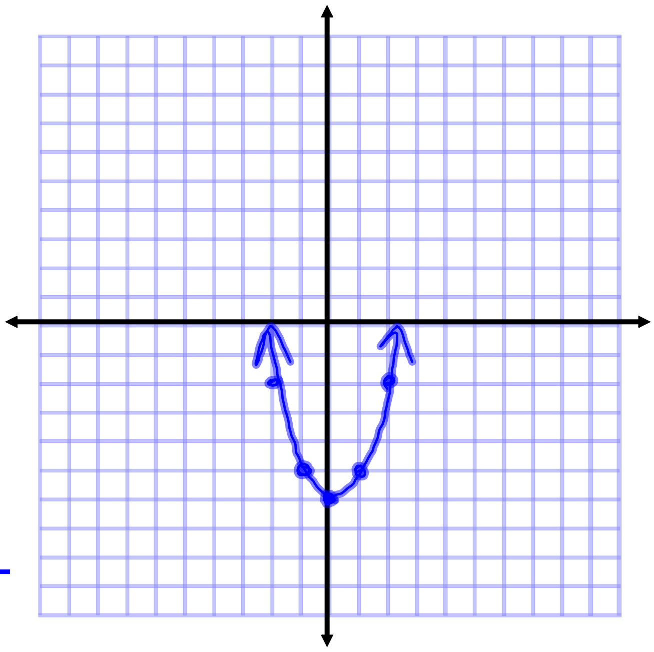
$$(x,y) \rightarrow (x-7,\ y)$$

This shows the vertex has shifted along the x-axis a negative 7 units.

$y=x^2-6$

$y=1(x+0)^2-6$

Vertex: (0,-6)

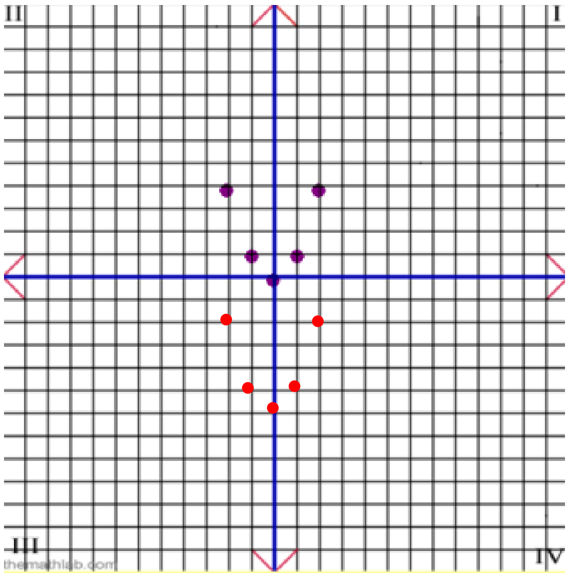


S.F: 1

Direction: up

Let's compare....

The graph has shifted along the y-axis. "negative 6" units



Mapping Rule:

$(x,y) \rightarrow (x, y-6)$

This shows the vertex has shifted along the y-axis a negative 6.

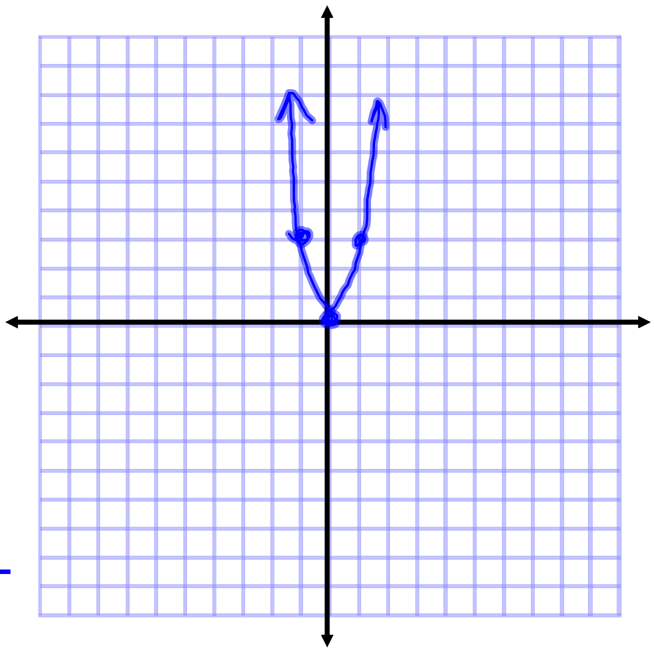
$y=3x^2$

$y=3(x+0)^2+0$

Vertex: (0,0)

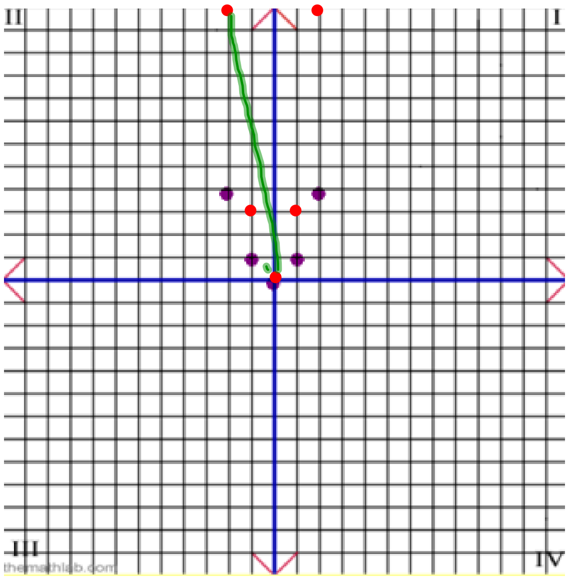
S.F: 3

Direction: up



Let's compare....

The graph has been stretched 3 times the original.



Mapping Rule:

$(x,y) \rightarrow (x, 3y)$

Notice the vertex has not shifted. The y values are three times greater than the original.

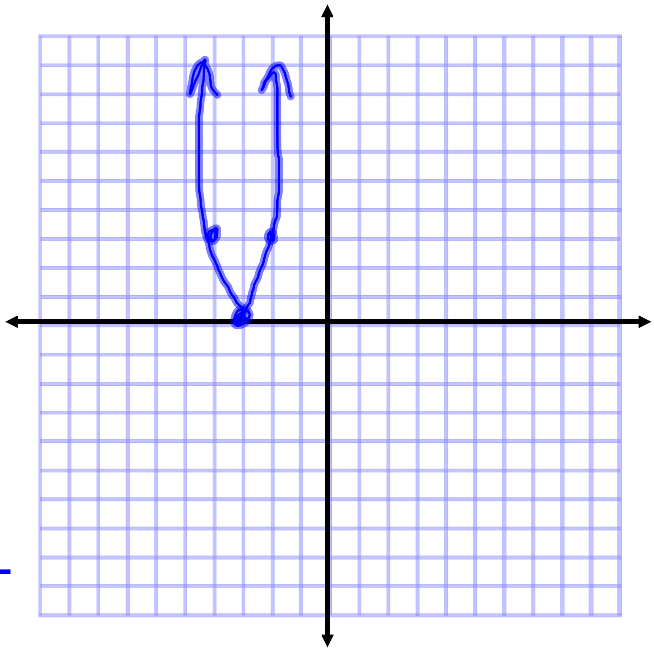
$$y=3(x+3)^2$$

$y=3(x+3)^2+0$

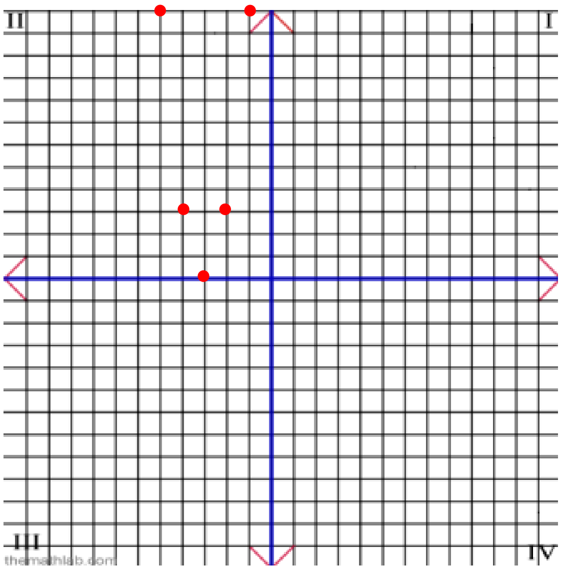
Vertex: $(-3,0)$

S.F: 3

Direction: Up



Let's compare.... $y=3(x+3)^2+0$



$(-3,0)$
SF=3

x, y
$(-3,0)$
SF=3

Mapping Rule:
$(x,y) \rightarrow (x-3, 3y)$

x y
Vertex: (-3, 0)

S.F: 3 (The graph has been stretched three times)

Direction: Up

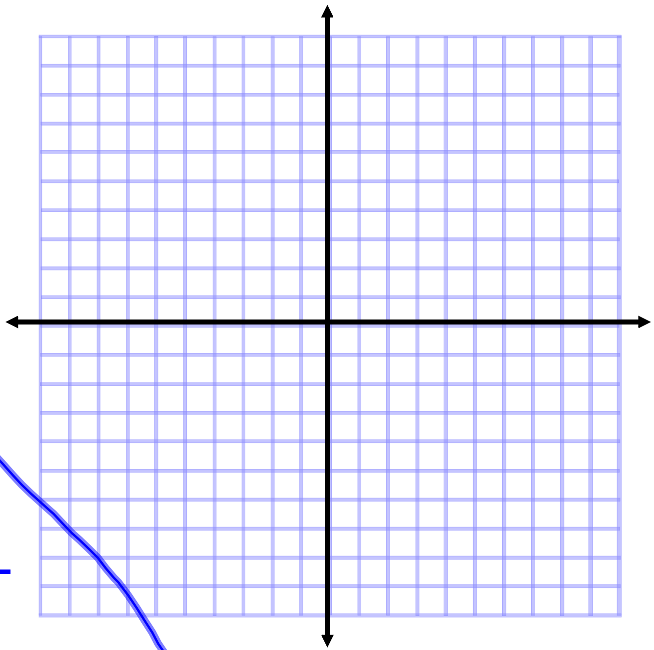
$y=2x^2-3$

$y=2(x+0)^2-3$

Vertex: $\overset{x}{(0}, \overset{y}{^-3)}$

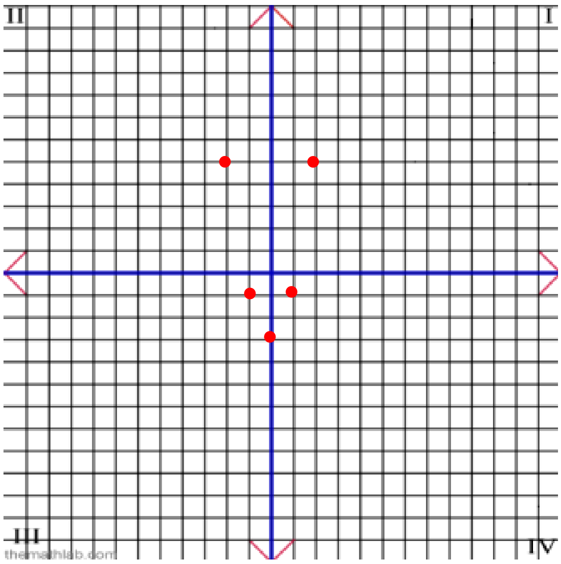
S.F: 2

Direction: up



$(x,y) \Rightarrow (x, 2y-3)$

Let's compare.... $y=2x^2-3$



Mapping Rule:

$(x,y) \rightarrow (x, 2y-3)$

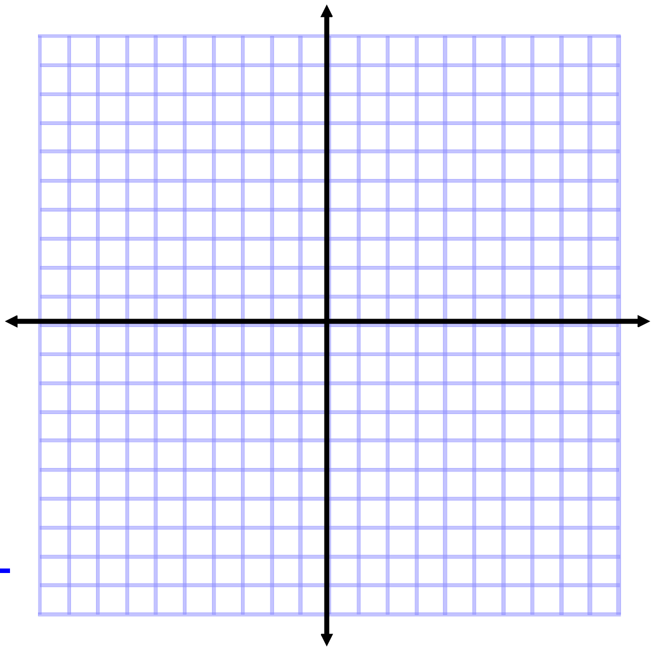
x y

Vertex: (0,-3)

S.F: 2 (The graph has been stretched two times)

Direction: Up

$$y=4(x+8)^2+3$$



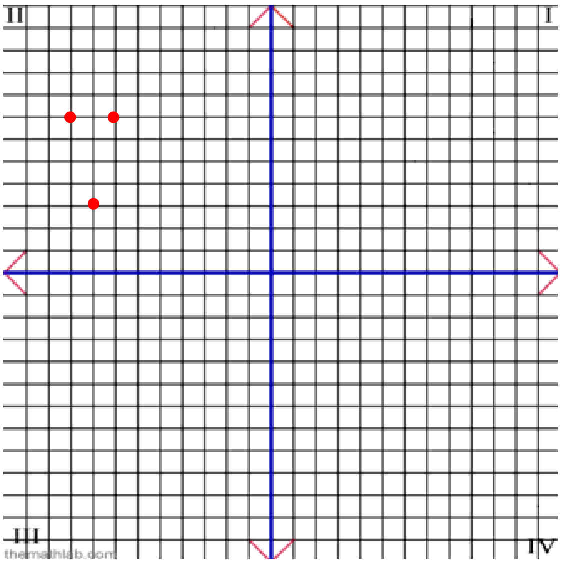
Vertex: $\left(\overset{x}{-8},\overset{y}{3}\right)$

S.F: 4

Direction: up

$(x,y) \Rightarrow (x-8, 4y+3)$

Let's compare.... $y=4(x+8)^2+3$



x y

Vertex: (-8,3)

S.F: 4 (The graph has been stretched four times)

Direction: Up

Mapping Rule:

$(x,y) \rightarrow (x-8,\ 4y+3)$

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

$\overset{x}{}\ \overset{y}{}$

V: $(2, -4)$

SF: 3

dir: up

$(x, y) \rightarrow (x+2, 3y-4)$

$y = -2(x-1)^2 - 6$

$\quad x, y$

V: $(1, -6)$

SF: 2

Dir: Down

$(x, y) \Rightarrow (x+1, -2y-6)$