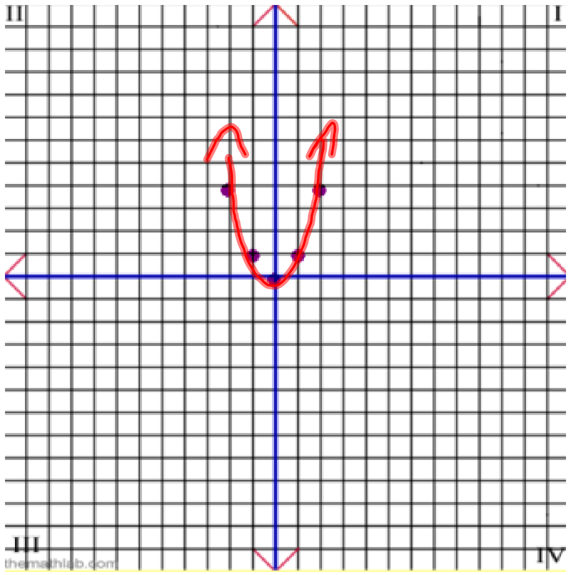
Mapping

$y=x^2$

All **QUADRATIC** functions originate from $y=x^2$.

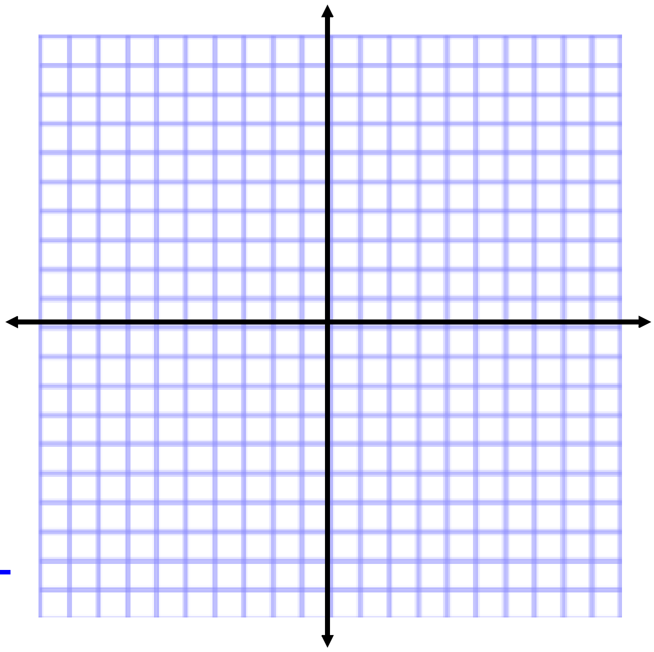


$$y=(x-8)^2$$

Vertex: (8, 0)

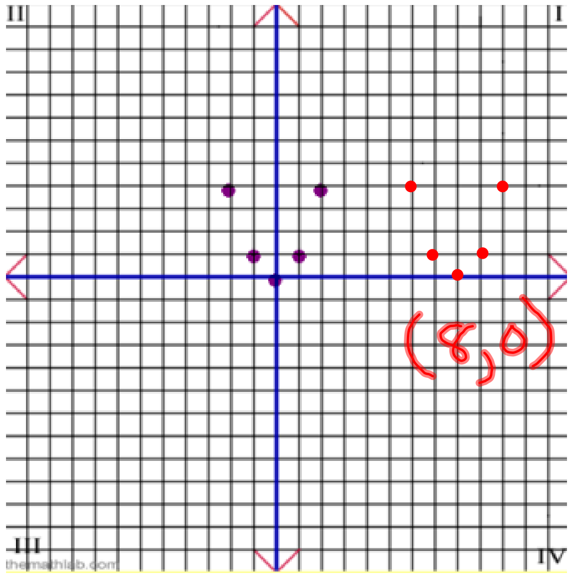
S.F: 1

Direction: ↑



Let's compare....

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

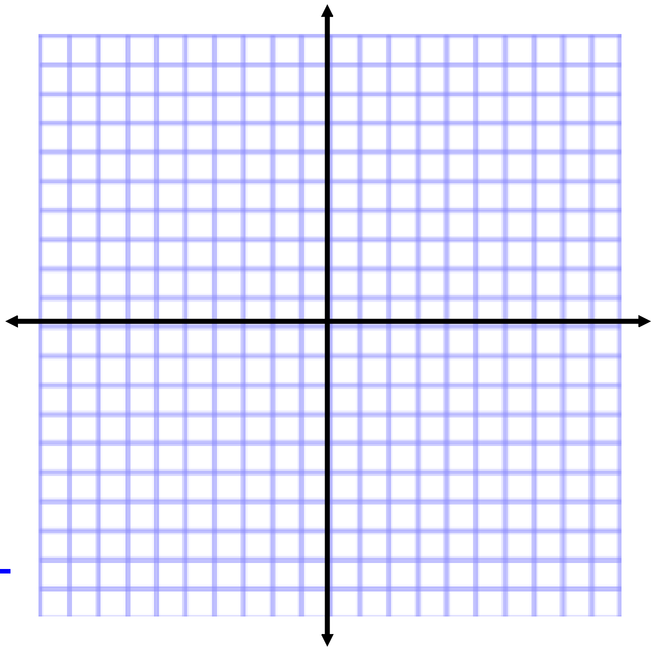


Mapping Rule:

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

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

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



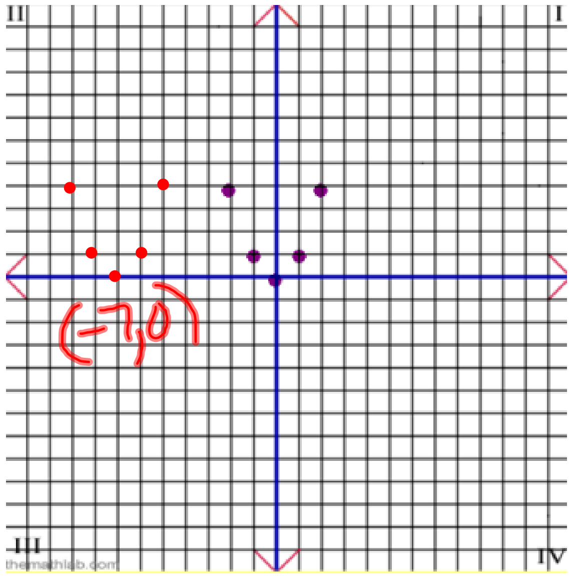
Vertex: (-7, 0)

S.F: 1

Direction: ↑

Let's compare....

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



Mapping Rule:

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

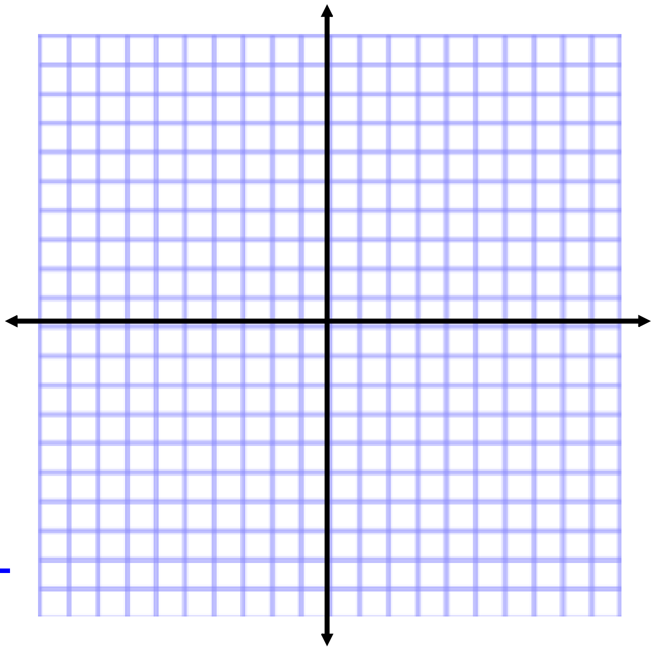
This shows the vertex has shifted along the x-axis a negative 7 units.

$y=x^2-6$

Vertex: (0, -6)

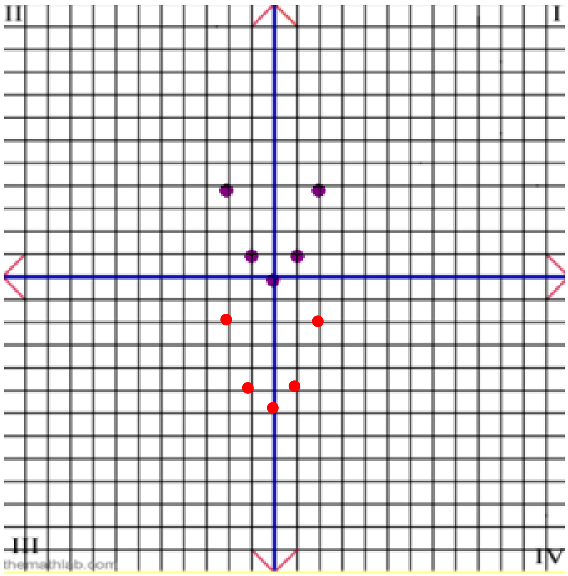
S.F: 1

Direction: ↑



Let's compare....

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



Mapping Rule:

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

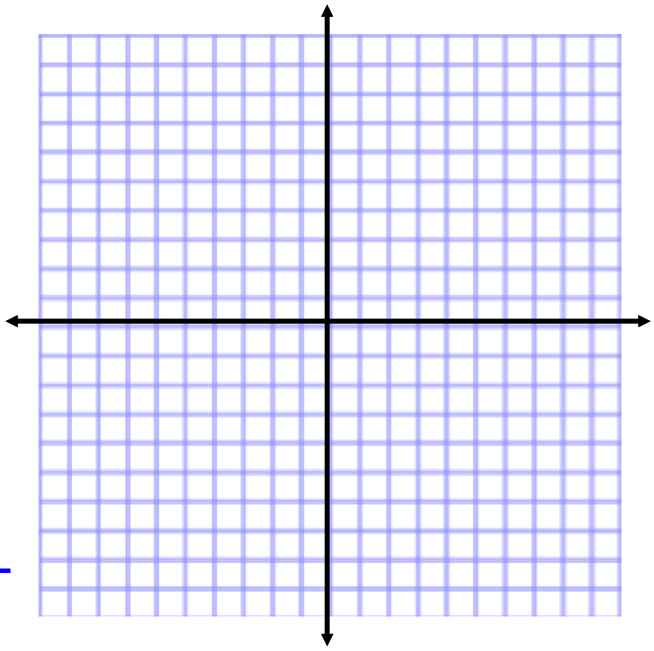
This shows the vertex has shifted along the y-axis a negative 6.

$y=3x^2$

Vertex: (0, 0)

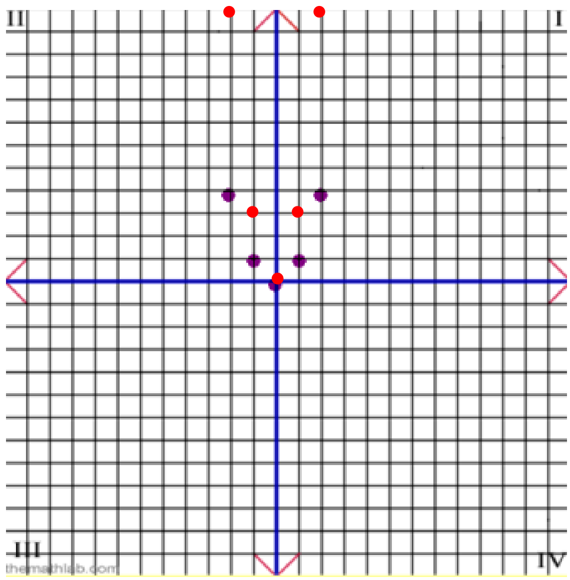
S.F: 3

Direction: ↑



Let's compare....

The graph has been **stretched** 3 times the original.



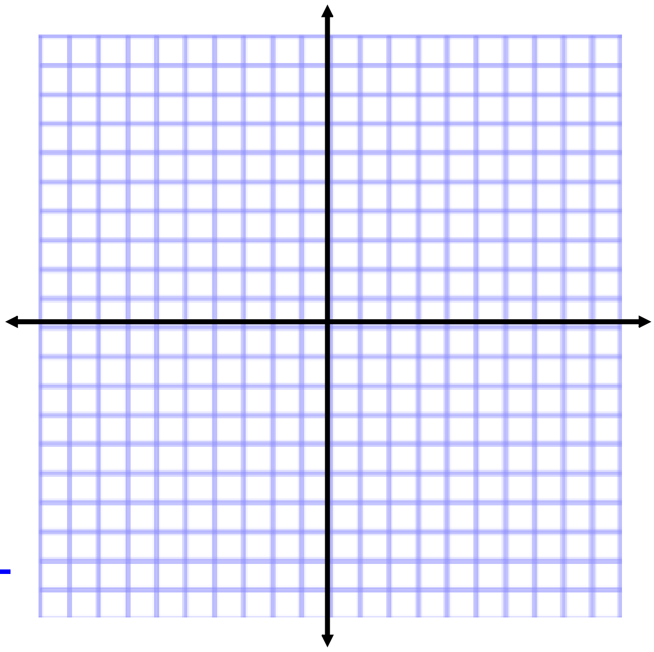
stretch factor

Mapping Rule:

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

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

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

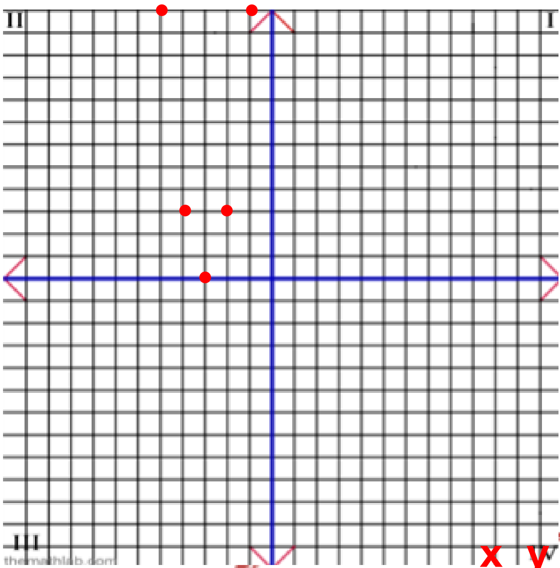


Vertex: ___________

S.F: ___________

Direction: ___________

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



x y

Vertex: (-3, 0)

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

Direction: Up

Mapping Rule:

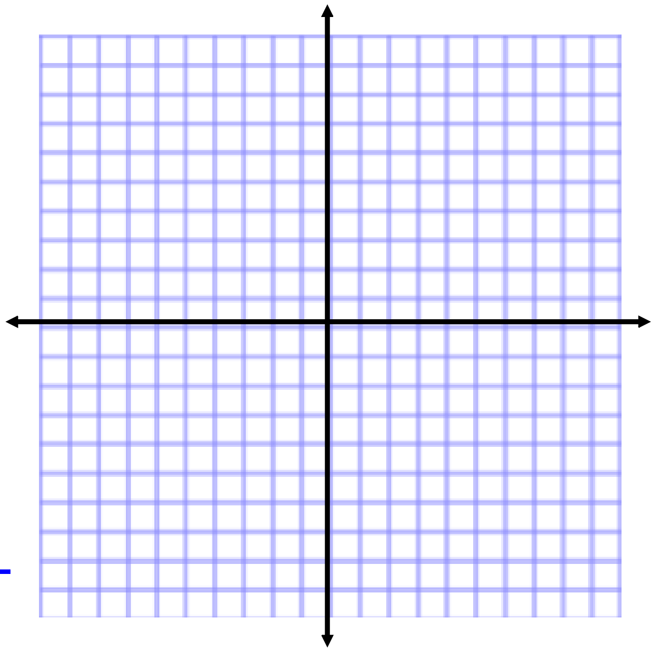
$(x,y) \rightarrow (x-3, 3y)$

$$y=2x^2-3$$

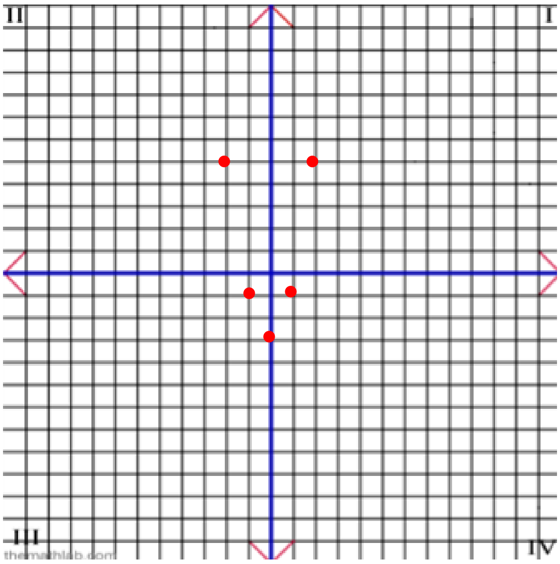
Vertex: ___________

S.F: ___________

Direction: ___________



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



(0, -3)

Mapping Rule:

(x,y)→(x, 2y-3)

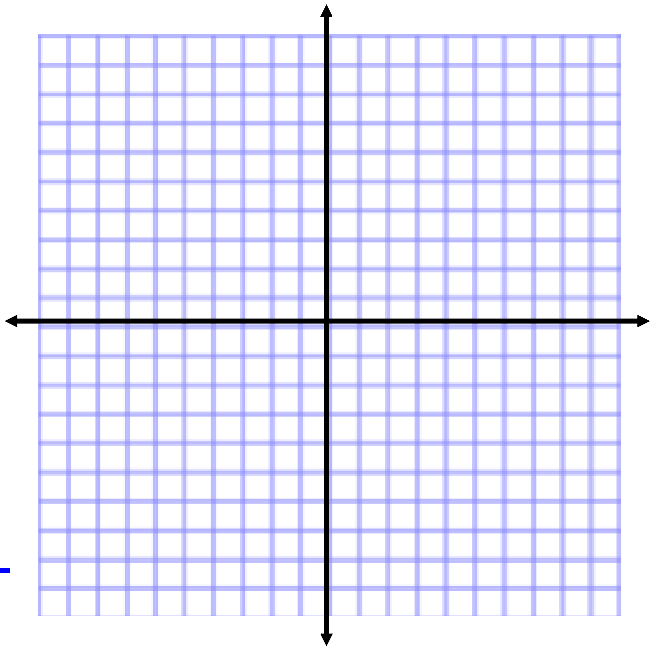
x y

Vertex: (0,-3)

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

Direction: Up

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

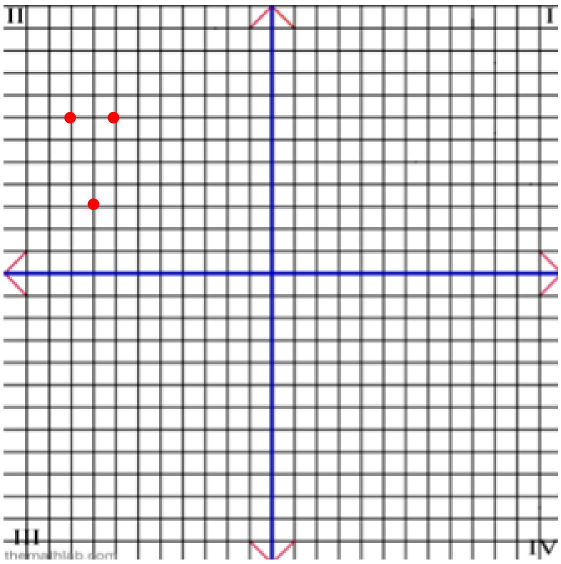


Vertex: ____________

S.F: ____________

Direction: ____________

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



Mapping Rule:

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

x y
Vertex: (-8,3)

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

Direction: Up