

**Bell Work**

1. Find the roots for  $f(x) = x^2 - 8x + 16$ .

2. What is the vertex of the parabola with the function to the right?

$$f(x) = 4(x - 6)^2 - 3$$

3. What is the function equation for the quadratic parent function?

4. What is the table used to graph quadratic functions?

Graph the quadratic function.

$$f(x) = x^2 + 6x + 3$$

$$f(x) - 3 = x^2 + 6x$$

$$f(x) - 3 + 9 = x^2 + 6x + 9$$

$$f(x) + 6 = (x + 3)^2$$

$$f(x) = (x + 3)^2 - 6$$

Vertex:  $(-3, -6)$

1. Move the  $c$  to the other side.
2. Add the new  $c$  to both sides.

$$c = \left(\frac{b}{2}\right)^2$$

3. Factor the right side.
4. Move the  $c$  back over.

$$c = \left(\frac{6}{2}\right)^2 = (3)^2 = 9$$

Graph the quadratic function.

$$f(x) = x^2 + 6x + 3$$

$$f(x) - 3 = x^2 + 6x$$

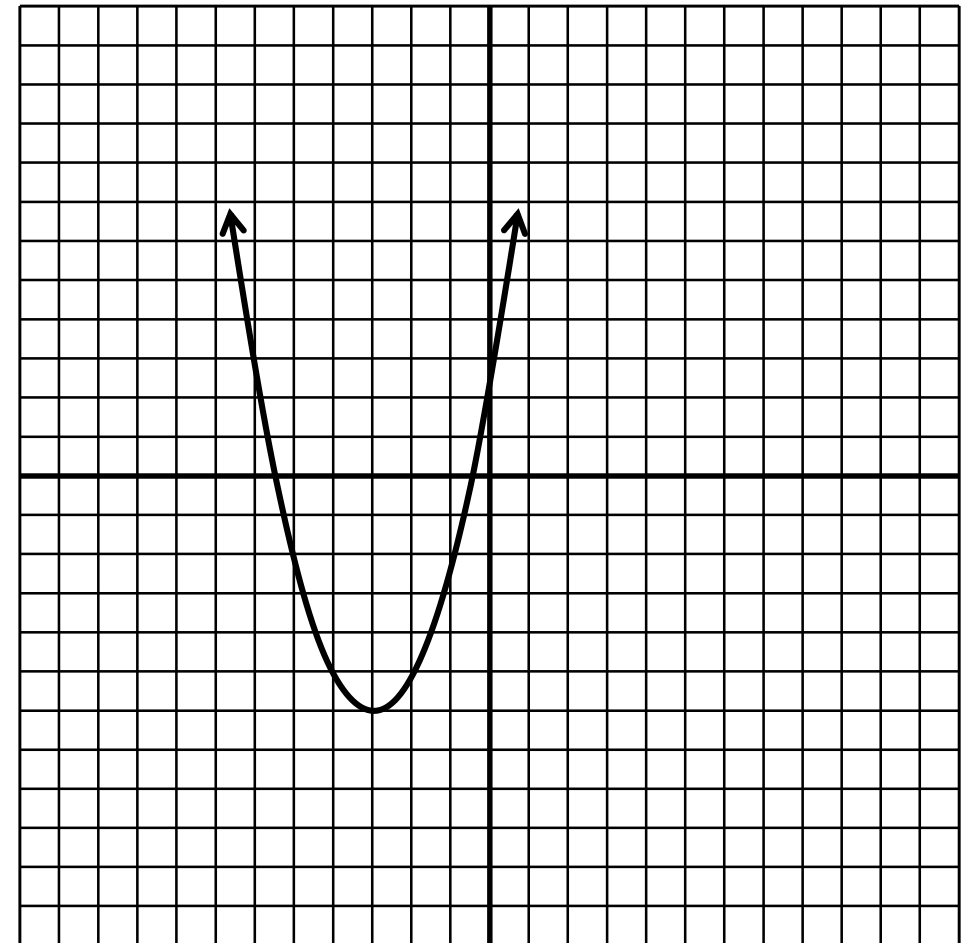
$$f(x) - 3 + 9 = x^2 + 6x + 9$$

$$f(x) + 6 = (x + 3)^2$$

$$f(x) = (x + 3)^2 - 6$$

Vertex:  $(-3, -6)$

Left/ Right	Up
1	1
2	4
3	9
4	16



Graph the quadratic function.

$$f(x) = x^2 - 8x + 11$$

$$f(x) - 11 = x^2 - 8x$$

$$f(x) - 11 + 16 = x^2 - 8x + 16$$

$$f(x) + 5 = (x - 4)^2$$

$$f(x) = (x - 4)^2 - 5$$

Vertex:  $(4, -5)$

1. Move the  $c$  to the other side.
2. Add the new  $c$  to both sides.

$$c = \left(\frac{b}{2}\right)^2$$

3. Factor the right side.
4. Move the  $c$  back over.

$$c = \left(\frac{-8}{2}\right)^2 = (-4)^2 = 16$$

Graph the quadratic function.

$$f(x) = x^2 - 8x + 11$$

$$f(x) - 11 = x^2 - 8x$$

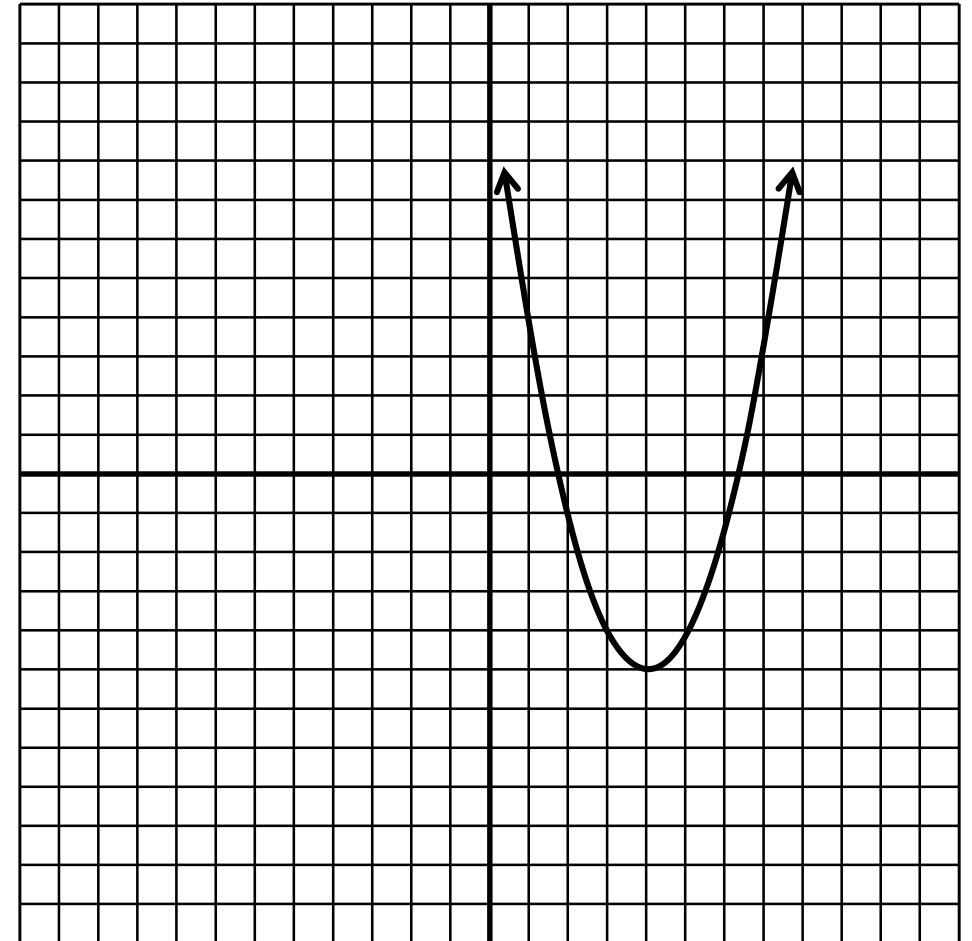
$$f(x) - 11 + 16 = x^2 - 8x + 16$$

$$f(x) + 5 = (x - 4)^2$$

$$f(x) = (x - 4)^2 - 5$$

Vertex:  $(4, -5)$

Left/ Right	Up
1	1
2	4
3	9
4	16



Graph the quadratic function.

$$f(x) = x^2 + 10x + 29$$

$$f(x) - 29 = x^2 + 10x$$

$$f(x) - 29 + 25 = x^2 + 10x + 25$$

$$f(x) - 4 = (x + 5)^2$$

$$f(x) = (x + 5)^2 + 4$$

Vertex:  $(-5, 4)$

1. Move the  $c$  to the other side.
2. Add the new  $c$  to both sides.

$$c = \left(\frac{b}{2}\right)^2$$

3. Factor the right side.
4. Move the  $c$  back over.

$$c = \left(\frac{10}{2}\right)^2 = (5)^2 = 25$$

Graph the quadratic function.

$$f(x) = x^2 + 10x + 29$$

$$f(x) - 29 = x^2 + 10x$$

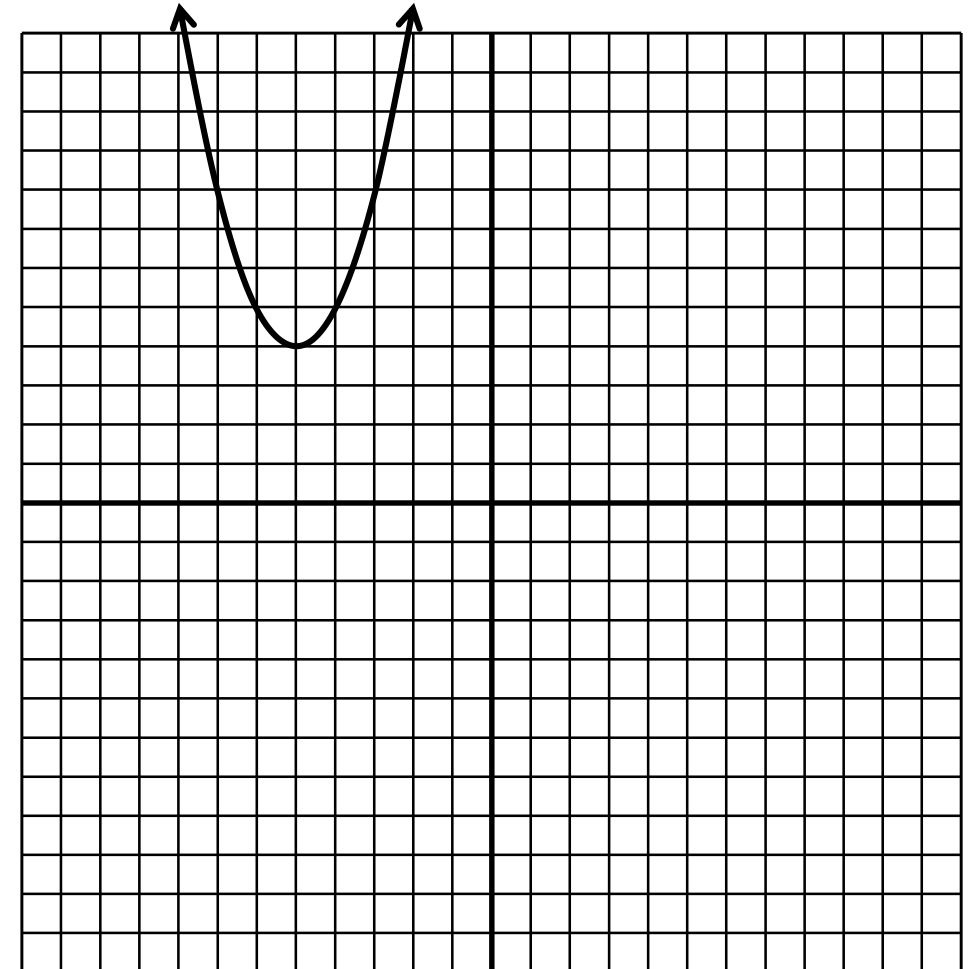
$$f(x) - 29 + 25 = x^2 + 10x + 25$$

$$f(x) - 4 = (x + 5)^2$$

$$f(x) = (x + 5)^2 + 4$$

Vertex:  $(-5, 4)$

Left/ Right	Up
1	1
2	4
3	9
4	16



Graph the quadratic function.

$$f(x) = x^2 - 5x - 1$$

$$f(x) + 1 = x^2 - 5x$$

$$f(x) + 1 + 6.25 = x^2 - 5x + 6.25$$

$$f(x) + 7.25 = (x - 2.5)^2$$

$$f(x) = (x - 2.5)^2 - 7.25$$

Vertex:  $(2.5, -7.25)$

1. Move the  $c$  to the other side.
2. Add the new  $c$  to both sides.

$$c = \left(\frac{b}{2}\right)^2$$

3. Factor the right side.
4. Move the  $c$  back over.

$$c = \left(\frac{5}{2}\right)^2 = (2.5)^2 = 6.25$$



Graph the quadratic function.

$$f(x) = x^2 - 5x - 1$$

$$f(x) + 1 = x^2 - 5x$$

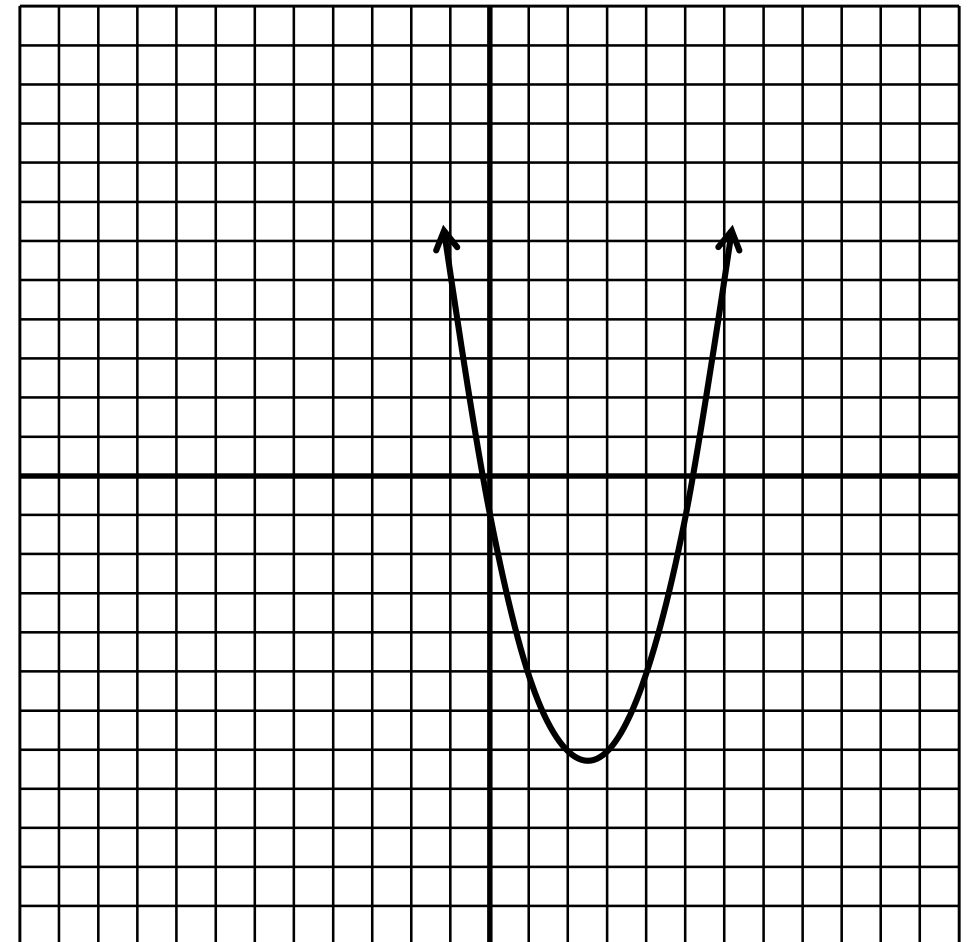
$$f(x) + 1 + 6.25 = x^2 - 5x + 6.25$$

$$f(x) + 7.25 = (x - 2.5)^2$$

$$f(x) = (x - 2.5)^2 - 7.25$$

Vertex:  $(2.5, -7.25)$

Left/ Right	Up
1	1
2	4
3	9
4	16



Graph the quadratic function.

$$f(x) = x^2 + 7x + 4$$

$$f(x) - 4 = x^2 + 7x$$

$$f(x) - 4 + 12.25 = x^2 + 7x + 12.25$$

$$f(x) + 8.25 = (x + 3.5)^2$$

$$f(x) = (x + 3.5)^2 - 8.25$$

Vertex:  $(-3.5, -8.25)$

1. Move the  $c$  to the other side.
2. Add the new  $c$  to both sides.

$$c = \left(\frac{b}{2}\right)^2$$

3. Factor the right side.
4. Move the  $c$  back over.

$$c = \left(\frac{7}{2}\right)^2 = (3.5)^2 = 12.25$$

Graph the quadratic function.

$$f(x) = x^2 + 7x + 4$$

$$f(x) - 4 = x^2 + 7x$$

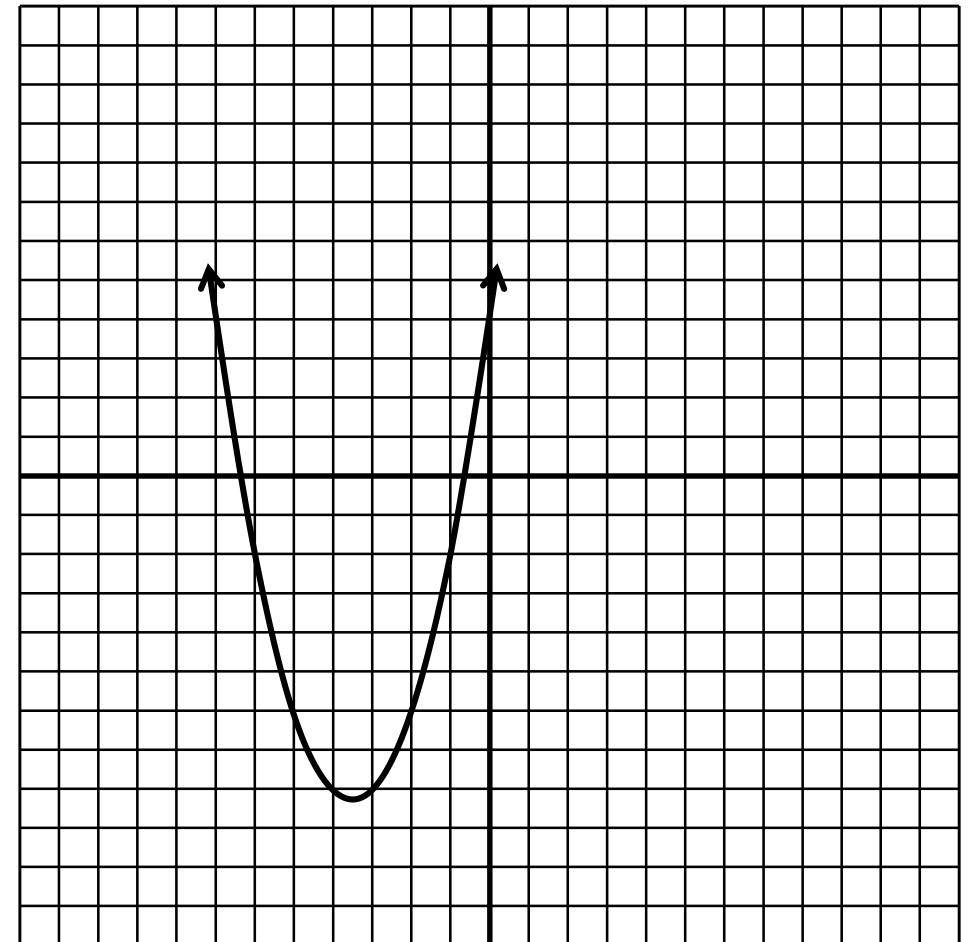
$$f(x) - 4 + 12.25 = x^2 + 7x + 12.25$$

$$f(x) + 8.25 = (x + 3.5)^2$$

$$f(x) = (x + 3.5)^2 - 8.25$$

Vertex:  $(-3.5, -8.25)$

Left/ Right	Up
1	1
2	4
3	9
4	16



**Assignment:**

**Finding the Vertex of a Quadratic Functions by  
Completing the Square A Worksheet**