

What you will learn about:  
Quadratic Inequalities

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

**Graphing Quadratics**

Parabole ↻ ↻

**Opens**

$a > 0$  open up (min)

$a < 0$  open down (max)

**Vertex (Max/Min)**

1) Find x-value

$$x = \frac{-b}{2a}$$

2) Find y-value

Plus x-value back into equation.

**X-Intercepts (Zeros)**

Set  $y = 0$  to zero

Solve.

Factor

Quadratic Formula

**Y-intercepts**

Let  $x = 0$  solve for

y.

$$(0, c)$$

**Axis of Symmetry**

$$x = \frac{-b}{2a}$$

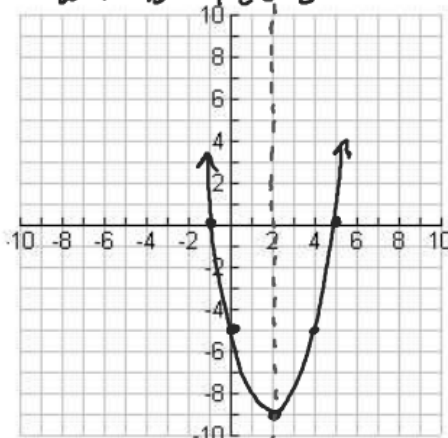
5. For each Quadratic function determine the following:

- Whether the graph has a Maximum or Minimum point
- Find the Vertex (Maximum or Minimum point).
- Axis of Symmetry
- The y-intercept
- The x-intercept(s)

Then graph the Function.

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

$a = 1$   $b = -4$   $c = -5$



open up

$$x = \frac{-b}{2a} = \frac{4}{2(1)} = 2$$

$$f(2) = 2^2 - 4(2) - 5 = 4 - 8 - 5 = -9$$

$$V(2, -9)$$

A.O.S.  $x = 2$

y-intercept  $(0, -5)$

x-intercepts

$$x^2 - 4x - 5 = 0$$

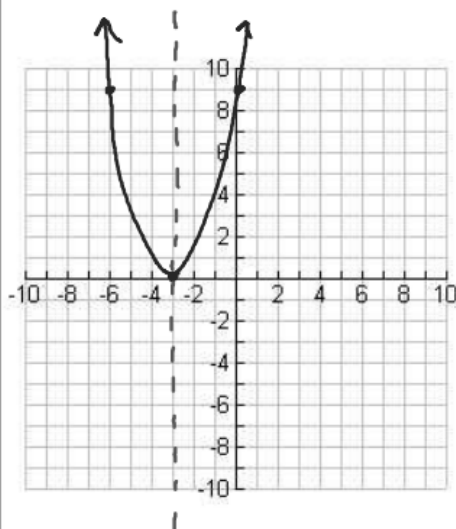
$$(x-5)(x+1) = 0$$

$$x-5 = 0 \quad x+1 = 0$$

$$x = 5 \quad x = -1$$

opens  
Vertex  
A.O.S  
y-intercept  
x-intercepts

b.  $g(x) = x^2 + 6x + 9$   
 $a=1$   $b=6$   $c=9$



x-intercepts

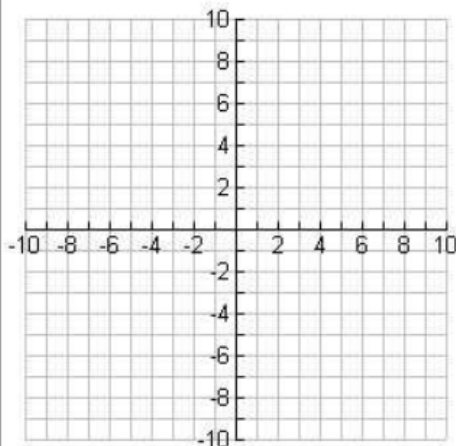
$$x^2 + 6x + 9 = 0$$

$$(x+3)(x+3) = 0$$

$$x+3=0 \quad x+3=0$$

$$x=-3 \quad x=-3$$

c.  $h(x) = -x^2 + 2x + 8$



opens up

$$x = \frac{-b}{2a}$$

$$= \frac{-6}{2(1)} = -3$$

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

$$= 9 - 18 + 9$$

$$= 0$$

$$V(-3, 0)$$

A.O.S  $x = -3$

y-intercept  $(0, 9)$