



## SOLVE BY GRAPHING WORKSHEET

**Transformations of Quadratic Functions**

$$y = a(x - h)^2 + k$$

a indicates a reflection across the x-axis and/or a vertical stretch or compression.
h indicates a horizontal translation
k indicates a vertical translation

### Graphing a Quadratic Function in Standard Form

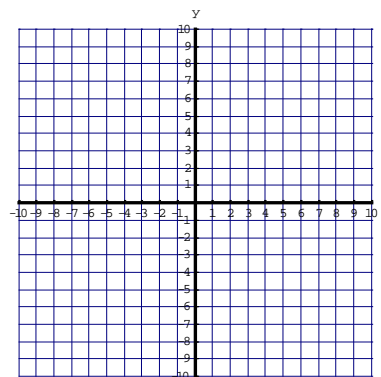
Standard Form of a Quadratic Function  $y = ax^2 + bx + c$ , when  $a \neq 0$ ;  $a$ ,  $b$ , and  $c$  are real numbers

Vertex: the vertex is the point  $\left(-\frac{b}{2a}, f\left(-\frac{b}{2a}\right)\right)$      Axis of Symmetry:  $x = -\frac{b}{2a}$      y-intercept:  $c$

**Graph each function. State the domain, the vertex, the range, the x-intercepts, and the axis of symmetry.**

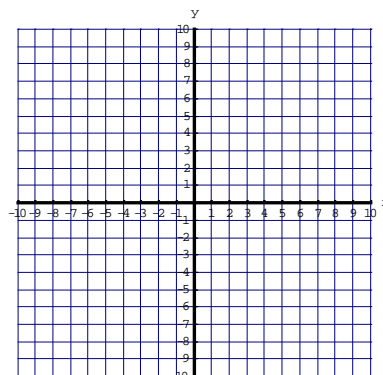
1.)  $f(x) = x^2 + 4$

Domain: \_\_\_\_\_  
 Range: \_\_\_\_\_  
 Vertex: \_\_\_\_\_  
 Max or min? \_\_\_\_\_  
 x-intercepts: \_\_\_\_\_  
 Axis of symmetry: \_\_\_\_\_



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

Domain: \_\_\_\_\_  
 Range: \_\_\_\_\_  
 Vertex: \_\_\_\_\_  
 Max or min? \_\_\_\_\_  
 x-intercepts: \_\_\_\_\_  
 Axis of symmetry: \_\_\_\_\_



**Without graphing the quadratic functions, complete the requested information:**

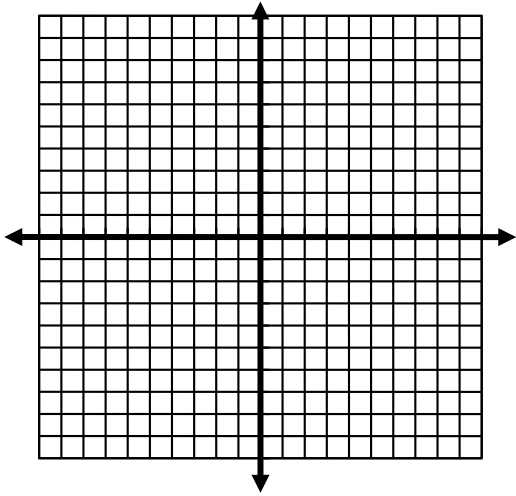
3.)  $f(x) = 2x^2 + 9x - 3$

4.)  $g(x) = -\frac{2}{3}x^2 + 2x - 5$

What is the direction of opening? \_\_\_\_\_  
 Is the vertex a max or min? \_\_\_\_\_  
 Wider or narrower than  $y = x^2$ ? \_\_\_\_\_

What is the direction of opening? \_\_\_\_\_  
 Is the vertex a max or min? \_\_\_\_\_  
 Wider or narrower than  $y = x^2$ ? \_\_\_\_\_

5) Graph:  $y = x^2 - 7x + 10$ . Answer the following questions.



What is the axis of symmetry? \_\_\_\_\_

What are the coordinates of the vertex? \_\_\_\_\_

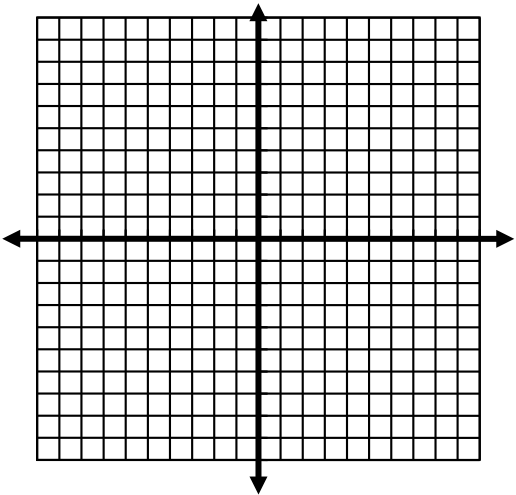
Is the vertex a max or minimum point? \_\_\_\_\_

How many roots are there? \_\_\_\_\_

What are the solutions of this equation? \_\_\_\_\_

What are the solutions called? \_\_\_\_\_

6) Graph:  $y = -x^2 - 6x - 5$ . Answer the following questions.



What is the axis of symmetry? \_\_\_\_\_

What are the coordinates of the vertex? \_\_\_\_\_

Is the vertex a max or minimum point? \_\_\_\_\_

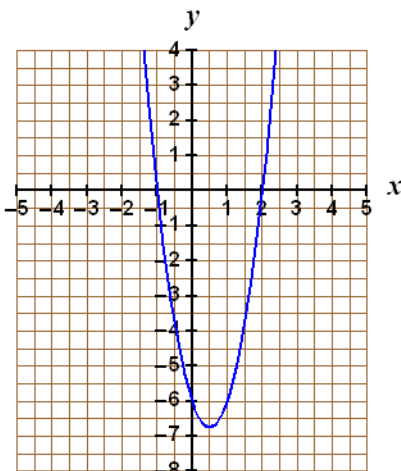
How many roots are there? \_\_\_\_\_

What are the solutions of this equation? \_\_\_\_\_

What do you call these solutions? \_\_\_\_\_

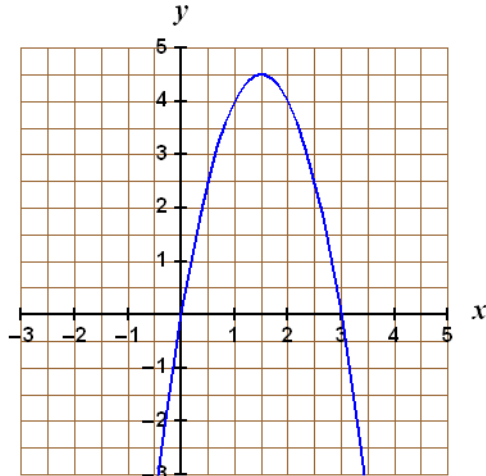
**For #7-8, a quadratic function and its graph are shown. Identify the solutions, or roots, of the related quadratic equation.**

7.)  $g(x) = 3x^2 - 3x - 6$



Solve:  $x = \underline{\hspace{1cm}}$  or  $\underline{\hspace{1cm}}$

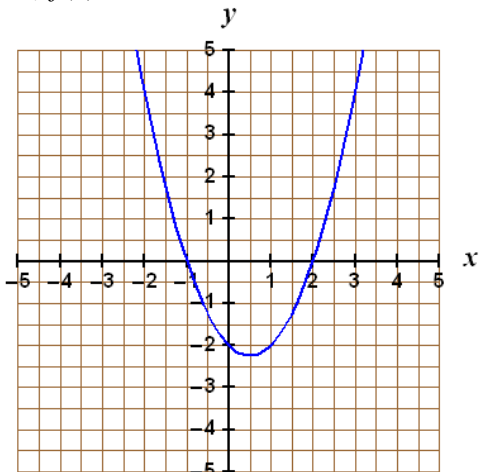
8.)  $h(x) = -2x^2 + 6x$



Solve:  $x = \underline{\hspace{1cm}}$  or  $\underline{\hspace{1cm}}$

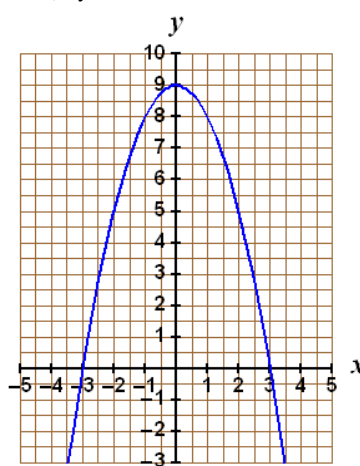
For #9-10, a quadratic function and its graph are shown. Identify the solutions, or roots, of the related quadratic equation.

9.)  $f(x) = x^2 - x - 2$



Solve:  $x = \underline{\hspace{1cm}}$  or  $\underline{\hspace{1cm}}$

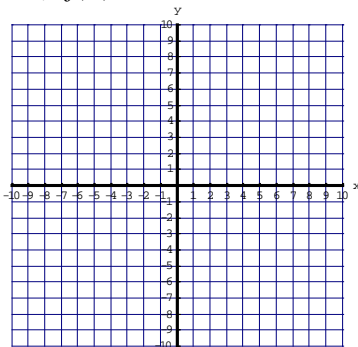
10.)  $y = -x^2 + 9$



Solve:  $x = \underline{\hspace{1cm}}$  or  $\underline{\hspace{1cm}}$

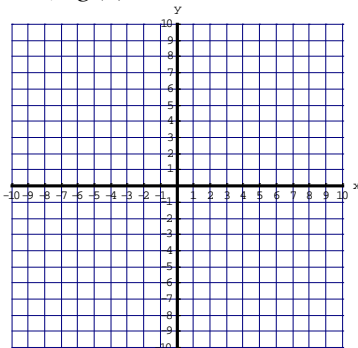
Find the vertex of each parabola. Graph the function and find the requested information

11.)  $f(x) = x^2 - 2x - 3$       $a = \underline{\hspace{1cm}}, b = \underline{\hspace{1cm}}, c = \underline{\hspace{1cm}}$



Vertex:  $\underline{\hspace{2cm}}$   
 Max or min?  $\underline{\hspace{2cm}}$   
 Direction of opening?  $\underline{\hspace{2cm}}$   
 Wider or narrower than  $y = x^2$ ?  
 $\underline{\hspace{2cm}}$   
 Domain:  $\underline{\hspace{2cm}}$   
 Range:  $\underline{\hspace{2cm}}$   
 x-intercepts:  $\underline{\hspace{2cm}}$   
 Axis of symmetry:  $\underline{\hspace{2cm}}$

12.)  $g(x) = -2x^2 + 8x - 5$       $a = \underline{\hspace{1cm}}, b = \underline{\hspace{1cm}}, c = \underline{\hspace{1cm}}$



Vertex:  $\underline{\hspace{2cm}}$   
 Max or min?  $\underline{\hspace{2cm}}$   
 Direction of opening?  $\underline{\hspace{2cm}}$   
 Wider or narrower than  $y = x^2$ ?  
 $\underline{\hspace{2cm}}$   
 Domain:  $\underline{\hspace{2cm}}$   
 Range:  $\underline{\hspace{2cm}}$   
 x-intercepts:  $\underline{\hspace{2cm}}$   
 Axis of symmetry:  $\underline{\hspace{2cm}}$