

# Standard Form

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

Name: \_\_\_\_\_

Hour: \_\_\_\_\_

1 What is the axis of symmetry  
 $f(x) = x^2 + 8x + 15$ ?

5 Explain how you can tell if the parabola will have a maximum or minimum value.

2 What is the vertex for  
 $f(x) = x^2 + 8x + 15$ ?

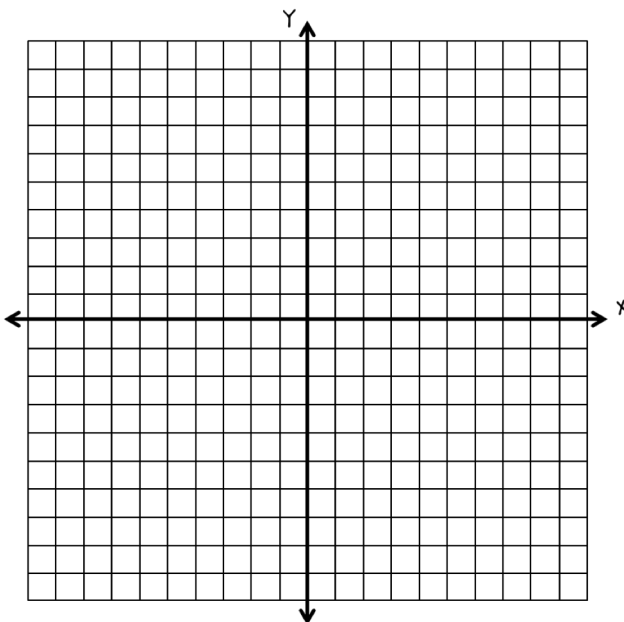
6 Change the quadratic equation  
 $y = 2x^2 + 9x + 10$  to intercept form. Calculate the axis of symmetry and vertex.

3 Complete the table for  $f(x) = x^2 + 8x + 15$ ?

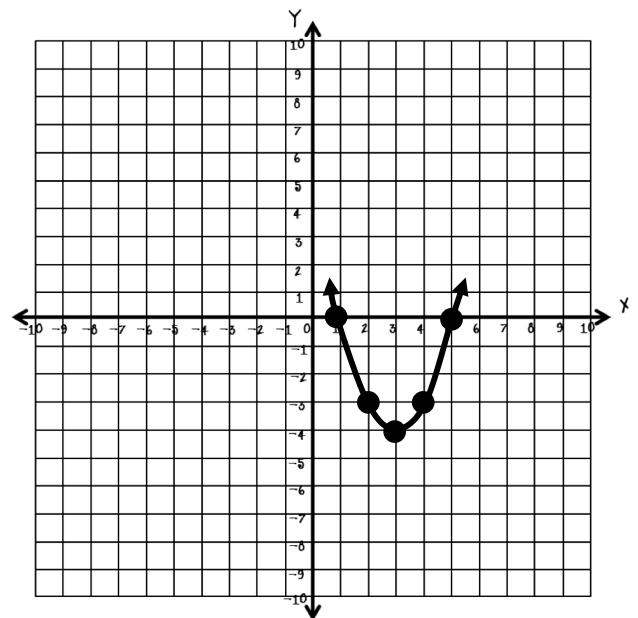
x	y

7 Change the quadratic equation  
 $y = x^2 + 4x + 3$  to vertex form. Calculate the axis of symmetry and vertex.

4 Draw the axis of symmetry and the points. Sketch the parabola.



8 Write an equation in standard form for the parabola graphed below.
















# STANDARD FORM $y = ax^2 + bx + c$

Name: \_\_\_\_\_

## SCAVENGER HUNT WORKSHEET

Hour: \_\_\_\_\_

Solve the first problem. The answer to this problem will lead you to the next problem to be completed. Look at the answers in the gray rectangular boxes. You should find your answer. Complete the next problem and so on until you have finished all twelve problems.

<b>START</b> One Solution  Your last answer	<b>IF YOU FOUND ...</b> $(-2, -2)$	<b>IF YOU FOUND ...</b> $x = -4$
If the a-value is -5, the parabola will open up or open down.  1	Calculate the vertex. $y = 3x^2 + 5$ 	Calculate the axis of symmetry. $y = 4x^2 + 4x$ 
<b>IF YOU FOUND ...</b> y-intercept	<b>IF YOU FOUND ...</b> Open Down	<b>IF YOU FOUND ...</b> $(1, -5)$
How many solutions does the following equation have? $x^2 - 5x + 7 = 0$ 	If the a-value is -5, the parabola have a maximum or minimum value? 	What is the line that passes through the vertex and divides a parabola into two symmetrical parts? 
<b>IF YOU FOUND ...</b> Axis of Symmetry	<b>IF YOU FOUND ...</b> No Solutions	<b>IF YOU FOUND ...</b> $x = -\frac{1}{2}$
The c-value will provide you with this. 	How many solutions does the following equation have? $x^2 - 18x = -81$ 	Calculate the vertex. $y = 2x^2 + 8x + 6$ 
<b>IF YOU FOUND ...</b> Maximum	<b>IF YOU FOUND ...</b> Minimum	<b>IF YOU FOUND ...</b> $(0, 5)$
The following equation will have a maximum or minimum value? $y = x^2 + 6x + 9$ 	Calculate the axis of symmetry. $y = x^2 + 8x + 12$ 	Calculate the vertex. $y = 2x^2 - 4x - 3$ 

# Standard Form

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

Name: KEY

Hour: \_\_\_\_\_

- ① What is the axis of symmetry  
 $f(x) = x^2 + 8x + 15$ ?

$$x = \frac{-b}{2a} \quad x = \frac{-8}{2(1)} \quad x = -4$$

- ② What is the vertex for  
 $f(x) = x^2 + 8x + 15$ ?

$$y = (-4)^2 + 8(-4) + 15$$

$$y = 16 + -32 + 15$$

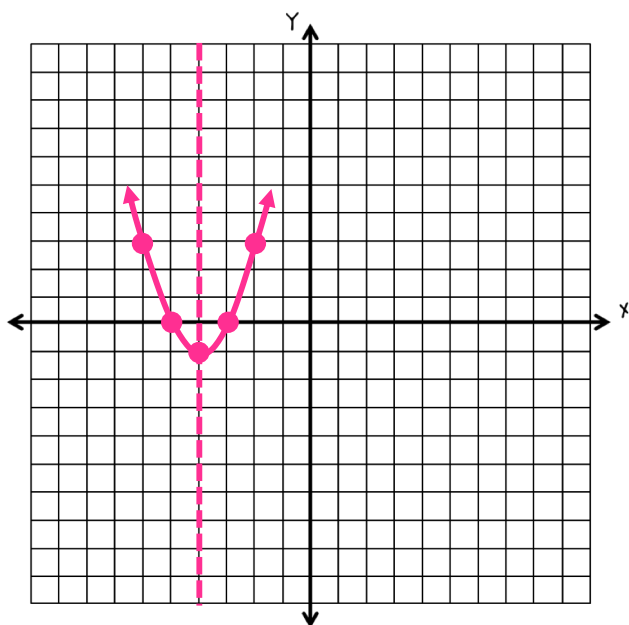
$$y = -1$$

The vertex is  $(-4, -1)$ .

- ③ Complete the table for  $f(x) = x^2 + 8x + 15$ ?

x	y
-6	3
-5	0
-4	-1
-3	0
-2	3

- ④ Draw the axis of symmetry and the points. Sketch the parabola.



- ⑤ Explain how you can tell if the parabola will have a maximum or minimum value.

The parabola opens up if  $a > 0$  and opens down if  $a < 0$ . If the parabola opens up, there will be a minimum value. If the parabola opens down, there will be a maximum value.

- ⑥ Change the quadratic equation  
 $y = 2x^2 + 9x + 10$  to intercept form. Calculate the axis of symmetry and vertex.

$$y = (2x + 5)(x + 2)$$

Axis of Symmetry =  $-4.5$

Vertex  $(-4.5, 10)$

- ⑦ Change the quadratic equation  
 $y = x^2 + 4x + 3$  to vertex form. Calculate the axis of symmetry and vertex.

$$y = x^2 + 4x + \left(\frac{4}{2}\right)^2 = 3 + \left(\frac{4}{2}\right)^2$$

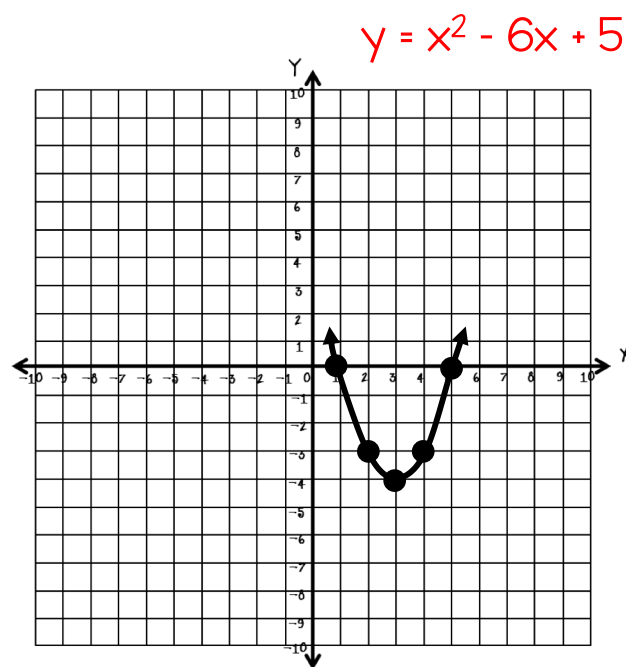
$$y = x^2 + 4x + 4 = 3 + 4$$

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

Axis of Symmetry =  $-2$

Vertex  $(-2, -1)$

- ⑧ Write an equation in standard form for the parabola graphed below.
















# STANDARD FORM $y = ax^2 + bx + c$

Name: Key

## SCAVENGER HUNT WORKSHEET

Hour: \_\_\_\_\_

Solve the first problem. The answer to this problem will lead you to the next problem to be completed. Look at the answers in the gray rectangular boxes. You should find your answer. Complete the next problem and so on until you have finished all twelve problems.

<b>START</b> One Solution  Your last answer	<b>IF YOU FOUND ...</b> (-2, -2)	<b>IF YOU FOUND ...</b> $x = -4$
If the a-value is -5, the parabola will open up or open down.  <b>1</b>	Calculate the vertex. $y = 3x^2 + 5$  <b>7</b>	Calculate the axis of symmetry. $y = 4x^2 + 4x$  <b>5</b>
<b>IF YOU FOUND ...</b> y-intercept	<b>IF YOU FOUND ...</b> Open Down	<b>IF YOU FOUND ...</b> (1, -5)
How many solutions does the following equation have? $x^2 - 5x + 7 = 0$  <b>11</b>	If the a-value is -5, the parabola have a maximum or minimum value?  <b>2</b>	What is the line that passes through the vertex and divides a parabola into two symmetrical parts?  <b>9</b>
<b>IF YOU FOUND ...</b> Axis of Symmetry	<b>IF YOU FOUND ...</b> No Solutions	<b>IF YOU FOUND ...</b> $x = -\frac{1}{2}$
The c-value will provide you with this.  <b>10</b>	How many solutions does the following equation have? $x^2 - 18x = -81$  <b>12</b>	Calculate the vertex. $y = 2x^2 + 8x + 6$  <b>6</b>
<b>IF YOU FOUND ...</b> Maximum	<b>IF YOU FOUND ...</b> Minimum	<b>IF YOU FOUND ...</b> (0, 5)
The following equation will have a maximum or minimum value? $y = x^2 + 6x + 9$  <b>3</b>	Calculate the axis of symmetry. $y = x^2 + 8x + 12$  <b>4</b>	Calculate the vertex. $y = 2x^2 - 4x - 3$  <b>8</b>