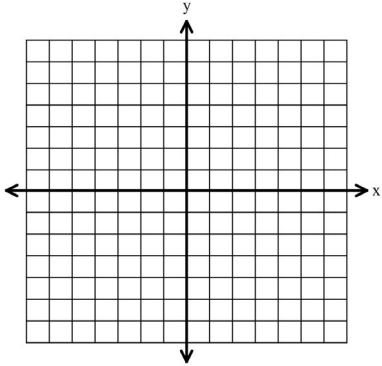
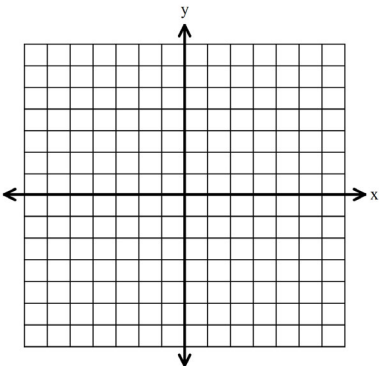
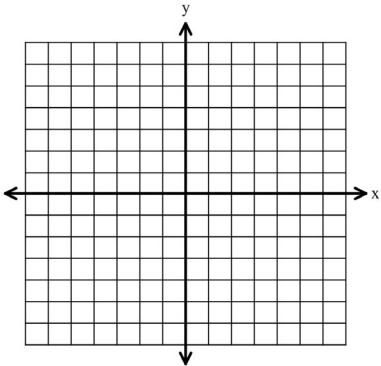
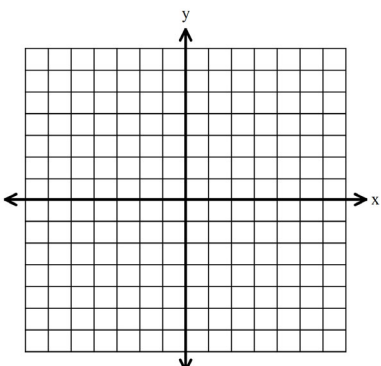
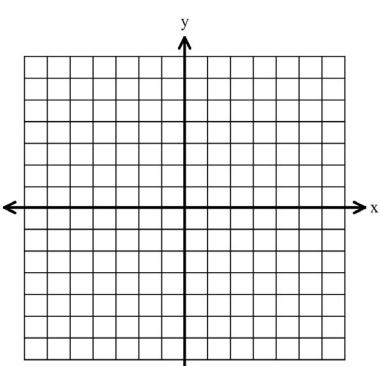
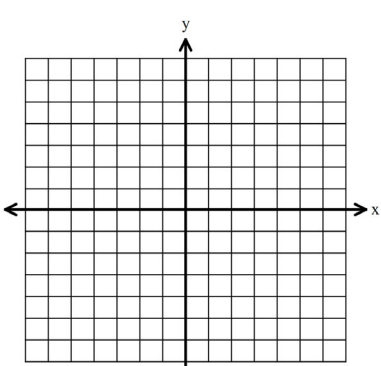
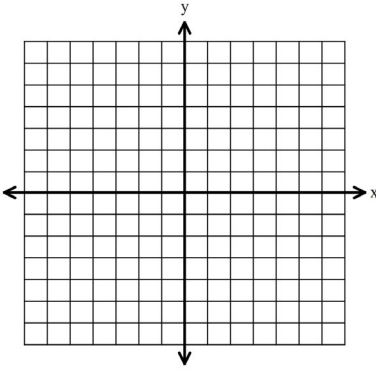
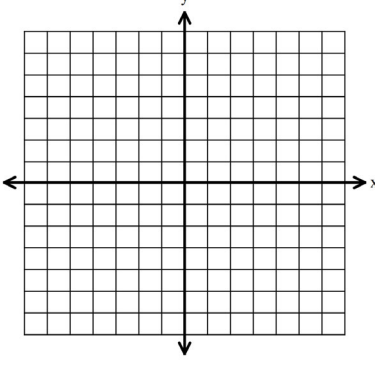
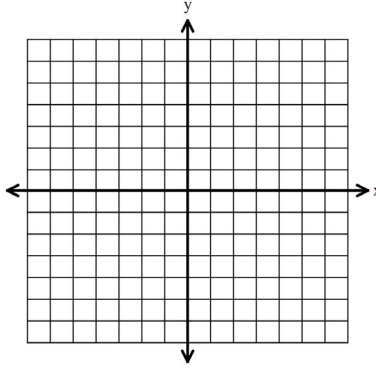
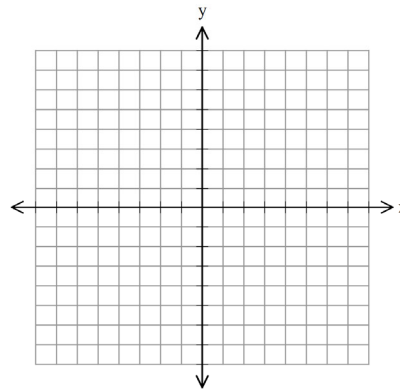


$y = (x + 2)^2 + 2$	$y = -(x - 2)^2 + 7$	$y = (x + 5)^2 - 1$
<p>1. Vertex:</p> <p>Transformations:</p> <p>D:</p> <p>R:</p> <p>Max/min:</p> <p>Axis of symmetry:</p> <p>y-intercept:</p>	<p>3. Vertex:</p> <p>Transformations:</p> <p>D:</p> <p>R:</p> <p>Max/min:</p> <p>Axis of symmetry:</p> <p>y-intercept:</p>	<p>5. Vertex:</p> <p>Transformations:</p> <p>D:</p> <p>R:</p> <p>Max/min:</p> <p>Axis of symmetry:</p> <p>y-intercept:</p>
<p>2.</p> 	<p>4.</p> 	<p>6.</p> 
$y = 3(x + 1)^2 + 3$	$y = -2(x - 3)^2 + 3$	$y = \frac{1}{2}(x + 5)^2 - 1$
<p>7. Vertex:</p> <p>Transformations:</p> <p>D:</p> <p>R:</p> <p>Max/min:</p> <p>Axis of symmetry:</p> <p>y-intercept:</p>	<p>9. Vertex:</p> <p>Transformations:</p> <p>D:</p> <p>R:</p> <p>Max/min:</p> <p>Axis of symmetry:</p> <p>y-intercept:</p>	<p>11. Vertex:</p> <p>Transformations:</p> <p>D:</p> <p>R:</p> <p>Max/min:</p> <p>Axis of symmetry:</p> <p>y-intercept:</p>
<p>8.</p> 	<p>10.</p> 	<p>12.</p> 

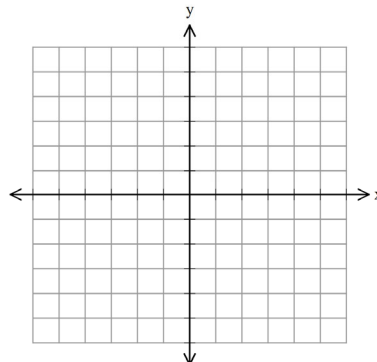
$y = -\frac{2}{5}(x + 5)^2$	$y = 5x^2 + 2$	$y = -0.5x^2$
<p>13. Vertex:</p> <p>Transformations:</p> <p>D:</p> <p>R:</p> <p>Max/min:</p> <p>y-intercept:</p>	<p>15. Vertex:</p> <p>Transformations:</p> <p>D:</p> <p>R:</p> <p>Max/min:</p> <p>y-intercept:</p>	<p>17. Vertex:</p> <p>Transformations:</p> <p>D:</p> <p>R:</p> <p>Max/min:</p> <p>y-intercept:</p>
<p>14.</p> 	<p>16.</p> 	<p>18.</p> 

19. Graph the piecewise function

$$f(x) = \begin{cases} 2 & x < -3 \\ \frac{2}{3}x - 2 & -3 \leq x < 3 \\ |x - 4| & x \geq 3 \end{cases}$$



20. Graph the line $y = \frac{1}{2}(x + 3) + 1$ with its parent function. Then describe how the function is transformed from the parent function

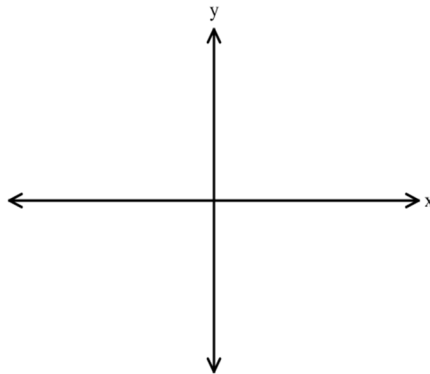


Algebra 2 worksheet 4.2

Name: _____

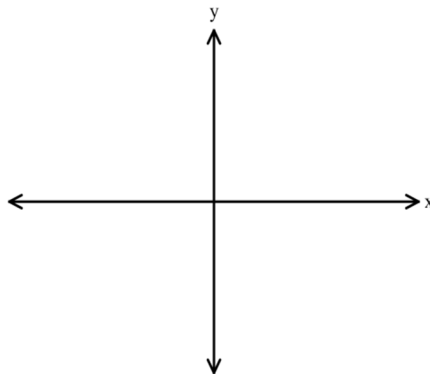
#1-6, Rewrite the equation in (h, k) form and draw a sketch using the vertex. Then give the requested information.

1.) $y = x^2 + 6x + 10$
2.)



Eq. in Vertex Form:
Transformations:
Vertex:
y-intercept:
Domain:
Range:
Max/Min:

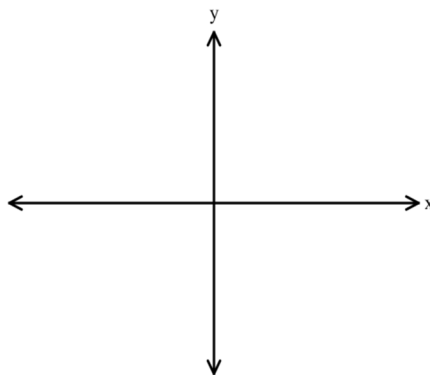
3.) $y = x^2 - 10x + 19$
4.)



Eq. in Vertex Form:
Transformations:
Vertex:
y-intercept:
Domain:
Range:
Max/Min:

5.) $y = 2x^2 + 12x - 15$

6.)



Eq. in Vertex Form:
Transformations:
Vertex:
y-intercept:
Domain:
Range:
Max/Min:

Simplify.

7. $\sqrt{-4} \cdot \sqrt{-6}$

8. $\sqrt{-150}$

9.) What is the range of the function $= -x^2 - 18x + 6$?

10.) What are the transformations on the function $y = 2x^2 + 4x - 15$

11.) Given $f(x) = 3(x - 4) + 1$, identify the name of the parent function and describe how the graph is transformed from the parent function.

- A. Quadratic Function with a vertical compression, translated right 4 and up 1
- B. Quadratic Function with a vertical stretch, translated right 4 and up 1
- C. Linear Function with a vertical compression, translated left 4 and up 1
- D. Linear Function with a vertical stretch, translated right 4 and up 1

12.) Rewrite $g(x)$ into vertex form: $g(x) = -2x^2 + 20x + 23$

13.) Given the function, $f(x) = -(x - 4)^2 - 3$, state whether the parabola opens up or down and the maximum or minimum value.

14.) If $(x + 3)(x - 9) = (x - h)^2 + k$, then what is the value of k ?

- A. $k = -36$
- B. $k = -27$
- C. $k = -18$
- D. $k = 9$

Algebra 2 worksheet 4.3

Name: _____

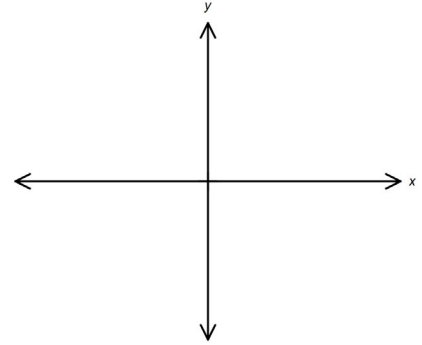
For 7-15, solve the equation by rewriting in vertex (h, k) form. Sketch a graph and label the vertex and x-intercepts.

$$y = x^2 - 4x - 165$$

1. find vertex form

2. find x-intercepts

3. graph completely

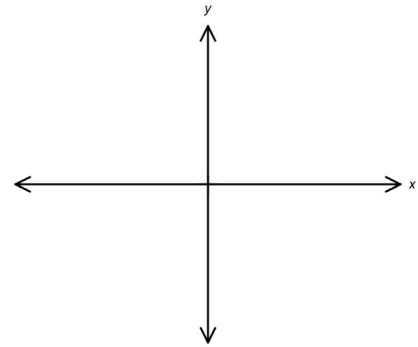


$$f(x) = -x^2 + 2x + 120$$

4. find vertex form

5. find x-intercepts

6. graph completely

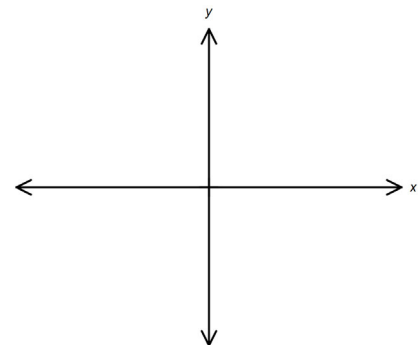


$$y = 2x^2 + 20x - 22$$

7. find vertex form

8. find x-intercepts

9. graph completely



10.) What is the y-intercept of the equation in #3?

11.) What is the range of the equation in #6?

12.) The function from #7, $y = 2x^2 + 20x - 22$, is shifted 3 units up and 2 to the left. What is the new equation for y ?

13.) Translate the graph of $f(x) = x^2$ four (4) units to the left, three (3) units up and stretch the graph by a factor of 2. Which of the following is the function after the transformations?

A. $f(x) = \frac{1}{2}(x + 4)^2 + 3$

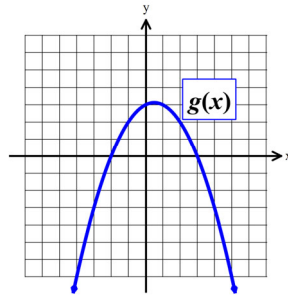
C. $f(x) = 2(x + 4)^2 + 3$

B. $f(x) = \frac{1}{2}(x - 3)^2 - 4$

D. $f(x) = 2(x - 3)^2 - 4$

14. Do $f(x)$ and $g(x)$ have the same solutions?

$$f(x) = 2x^2 - 4x - 16$$



15. Simplify: $\sqrt{-25} \cdot \sqrt{-81}$

16. Simplify: $3i(6 - 5i) - 4(2 + 3i)$

17. Simplify: $4x\sqrt{40x^7}$

18. Simplify: $3\sqrt{14} \cdot -3\sqrt{-2}$

19.) List the x-intercepts of $\frac{1}{2}(x + 4)^2 - 47 = 3$

Algebra 2 worksheet 4.4

Name: _____

1) What is the maximum or minimum value of $f(x) = x^2 + 8x - 12$?

2) What is the axis of symmetry of the function $f(x) = 2x^2 + 12x + 13$?

3) Translate $y = x^2 + 2x + 1$ four units to the right and 1 unit down. What is the equation of the new function, in vertex form?

4) A parabola has a vertex of $(-5, 8)$ and passes through the point $(-7, -4)$. In the $y = a(x - h)^2 + k$ form of the parabola, what is the value of a ?

5) A parabola has a vertex of $(-3, -21)$ and passes through the point $(-5, 1)$. In the $y = a(x - h)^2 + k$ form of the parabola, what is the value of a ?

6) If $f(x) = x^2 + 8x - 2 = a(x - h)^2 + k$, then what is the value of k ?

7) If $f(x) = x^2 + 10x - 23 = a(x - h)^2 + k$, then what is the value of h ?

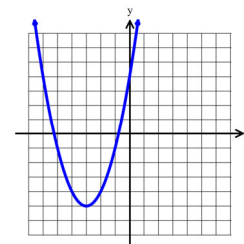
8) Which of the following have the same range as the function graphed? List all that apply!

I. $y = x^2 + 4x - 1$

II. $y = x^2 - 4x - 5$

III. $y = -(x - 6)^2 - 5$

IV. $y = 2(x + 4)^2 - 5$

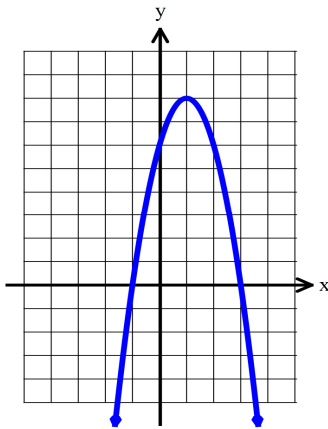


9) The graph $f(x) = x^2$ has a vertical compression of by a factor of $1/5$ and is shifted down 8. What is the equation of the function after the transformation?

10) Describe in words how the graph of $g(x) = -3(x + 5)^2$ would be transformed from the parent function $f(x) = x^2$.

11) Where does the function $f(x) = -3(x + 2)^2 + 10$ cross the y-axis?

12) given the graph of $h(x)$, fill in the requested information:



Transformations:

Vertex:

y-intercept:

Roots:

Domain:

Range:

Max/Min:

13. Compare the axis of symmetry and the minimum values for the two functions below.

$$h(x) = 2(x + 3)(x - 7)$$

$$j(x) = x^2 - 4x - 21$$

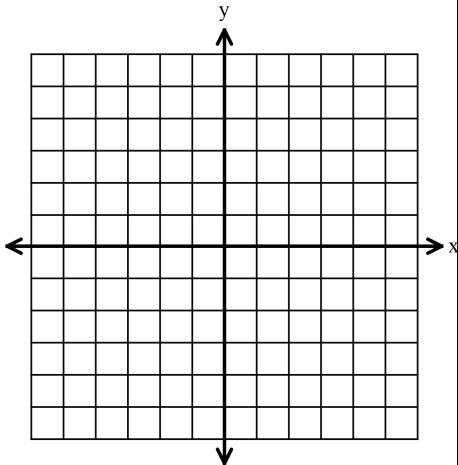
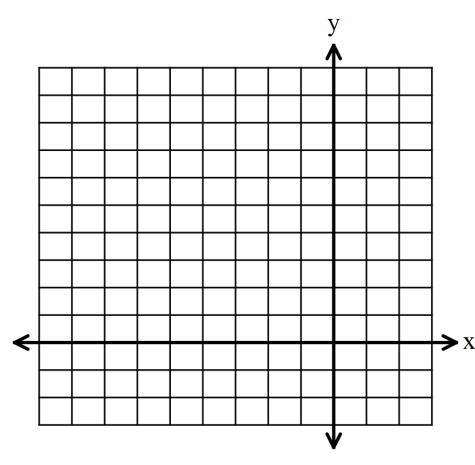
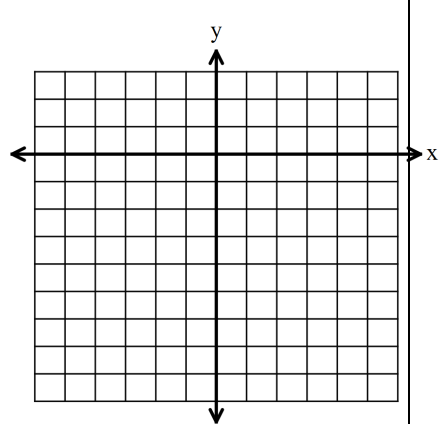
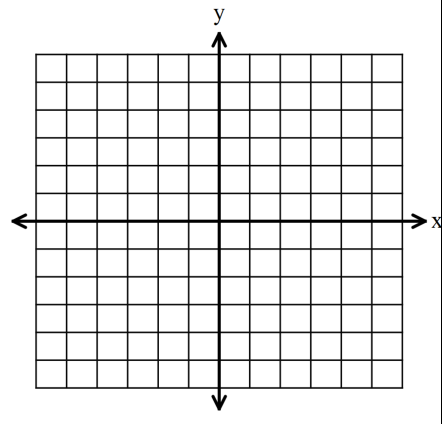
Determine which of the following statements is correct.

- A. The functions $h(x)$ and $j(x)$ have the same axis of symmetry, but the minimum value of $h(x)$ is less than the minimum value of $j(x)$.
- B. The functions $h(x)$ and $j(x)$ have the same axis of symmetry, but the minimum value of $h(x)$ is greater than the minimum value of $j(x)$.
- C. The functions $h(x)$ and $j(x)$ do not have the same axis of symmetry, and the minimum value of $h(x)$ is less than the minimum value of $j(x)$.
- D. The functions $h(x)$ and $j(x)$ do not have the same axis of symmetry, and the minimum value of $h(x)$ is greater than the minimum value of $j(x)$.

Algebra 2 Unit 4 Practice Test

Name: _____

For #1-4, graph. Include the vertex, x- & y-intercepts, axis of symmetry, min/max value, & domain & range. Write the domain & range in interval notation

1. $y = -(x - 2)^2 + 4$		2. $y = -x^2 - 12x - 27$	
Vertex:	Axis of Sym:	Vertex:	Axis of Sym:
x-intercepts:	y-intercept:	x-intercepts:	y-intercept:
min/max Value:	D: _____; R: _____	min/max Value:	D: _____; R: _____
			
3. $y = (x + 3)^2 - 9$		4. $y = -5x^2 + 5$	
Vertex:	Axis of Sym:	Vertex:	Axis of Sym:
x-intercepts:	y-intercept:	x-intercepts:	y-intercept:
min/max Value:	D: _____; R: _____	min/max Value:	D: _____; R: _____
			

Re-write each equation in vertex form. (Hint: $(-\frac{b}{2a}, f(-\frac{b}{2a}))$), then identify the vertex, domain, range, zeros, axis of symmetry

5. $y = x^2 - 2x - 8$

Vertex:
Domain:
Range:
Axis of Symmetry
Zeros:

6. $f(x) = 3x^2 + 12x - 9$

Vertex:
Domain:
Range:
Axis of Symmetry
Zeros:

7. $y = x^2 + 10x - 4$

Vertex:
Domain:
Range:
Axis of Symmetry
Zeros:

8. $y = -x^2 - 14x - 53$

Vertex:
Domain:
Range:
Axis of Symmetry
Zeros:

9. The graph of $h(x) = -x^2 + 10x + 16$ models the height, in feet, of one of the arches at the entrance of a parking structure. What is the height of the parking structure, at the highest point of the arch?
10. Which of following functions does NOT represent the parabola with a vertex at $(1, 4)$ and x -intercepts $(-1, 0)$ and $(3, 0)$.
- A. $f(x) = -x^2 + x + 4$ C. $f(x) = -x^2 + 2x + 3$
B. $f(x) = -(x - 1)^2 + 4$ D. $f(x) = -(x^2 - 2x - 3)$
11. Given the function, $f(x) = x^2 + 10x + 23$, state whether the parabola opens up or down and the maximum or minimum value.
12. Compare the functions, $f(x)$ and $g(x)$, and explain how the graph of $f(x) = x^2 - 4x + 4$ is related to the graph of $g(x) = x^2 - 4x - 2$.
- A. $f(x)$ is vertically stretched to make $g(x)$
B. $f(x)$ is translated 6 units left to make $g(x)$
C. $f(x)$ is translated down 6 units to make $g(x)$
D. $f(x)$ is compressed vertically to make $g(x)$
13. A parabola has a vertex of $(5, 6)$ and passes through the point $(10, -4)$. In the $y = a(x - h)^2 + k$ form of the parabola, what is the value of a ?
14. The graph $f(x) = x^2$ has a vertical compression of by a factor of $\frac{1}{2}$, is shifted up 6, and right 5. What is the equation of the function after the transformation?
15. Describe in words how the graph of $g(x) = -5(x + 2)^2 - 3$ would be transformed from the parent function $f(x) = x^2$.

16. Where does the function $f(x) = -\frac{1}{2}(x + 4)^2 - 3$ cross the y-axis?

17. A parabola has a vertex of $(-2, 10)$ and passes through the point $(-3, 6)$. In the $y = a(x - h)^2 + k$ form of the parabola, what is the value of a ?

18. If $f(x) = x^2 + 12x + 41 = a(x - h)^2 + k$,
then what is the value of k ?

19. If $f(x) = x^2 - 14x + 39 = a(x - h)^2 + k$,
then what is the value of h ?

20. The graph of $h(x) = -x^2 + 22x - 40$ models the height of one of the arches under a bridge, in feet.

a) What is the maximum height of the arch?

b) How wide is the arch?