Algebra I:
Characteristics of Quadratics HW

Name: _____

1. Equation _____

Domain: _____

Range: _____

x-intercept: _____

y-intercept: _____

End Behavior: _____

_____

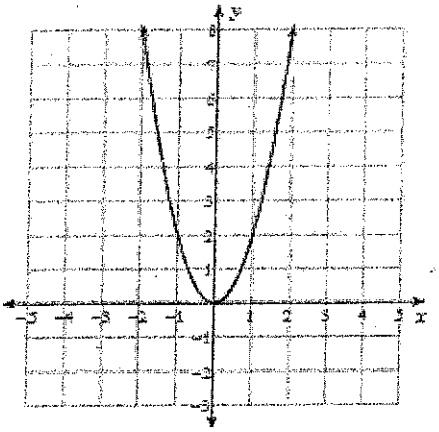
Decreasing: _____

Increasing: _____

Vertex: _____

Max/Min: _____

$$y = 2x^2$$



$$y = x(x+4)$$

2. Equation _____

Domain: _____

Range: _____

x-intercept: _____

y-intercept: _____

End Behavior: _____

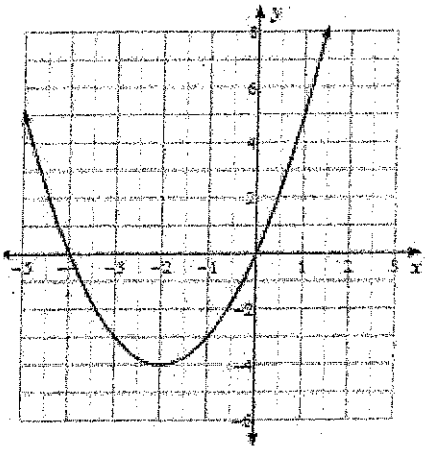
_____

Decreasing: _____

Increasing: _____

Vertex: _____

Max/Min: _____



$$y = -x^2 - 4x + 5$$

3. Equation _____

Domain: _____

Range: _____

x-intercept: _____

y-intercept: _____

End Behavior: _____

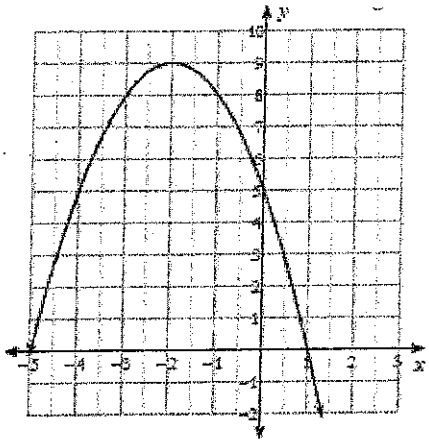
_____

Decreasing: _____

Increasing: _____

Vertex: _____

Max/Min: _____



Name_____ Date_____ Period_____

QUADRATIC TRANSFORMATIONS WORKSHEET

1. Write the generalized vertex form of a quadratic equation.

2. What does changing the "a" variable do to the graph of a quadratic function?

3. Being specific, name 3 ways that a parabola changes with different types of "a" values.

4. What does changing the "h" variable do to the graph of a quadratic function?

5. If "h" is positive how does the parabola move? If negative?

6. What does changing the "k" variable do to the graph of a quadratic function?

7. If "k" is positive how does the parabola move? If negative?

8. What conclusion can you make about the variables of h and k together?

Describe how the following equations transformed from $y = x^2$.

9. $y = 3x^2 - 5$

10. $y = \frac{1}{3}(x+1)^2$

11. $y = -2(x-3)^2 + 4$

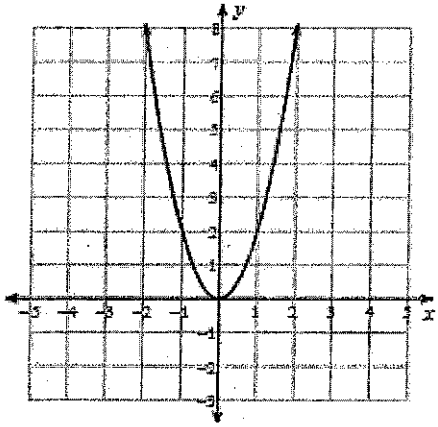
12. $y = -(x+5)^2 - 3$

Algebra I:
Characteristics of Quadratics HW

Name: Answer Key

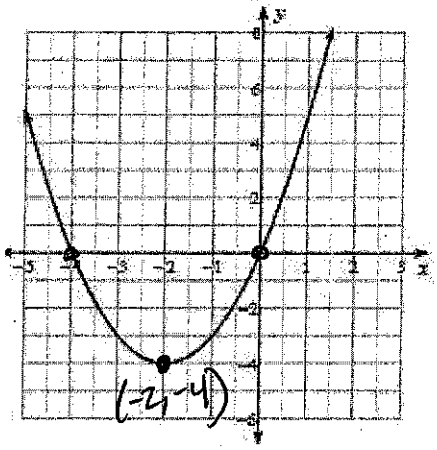
1. Equation $y = 2x^2$
Domain: $(-\infty, \infty)$
Range: $(0, \infty)$
x-intercept: $(0,0)$
y-intercept: $(0,0)$
End Behavior: $x \to \infty, y \to \infty$
$x \to -\infty, y \to \infty$
Decreasing: $(-\infty, 0)$
Increasing: $(0, \infty)$
Vertex: $(0,0)$
Max/Min: Min $y = 0$

$y = 2x^2$



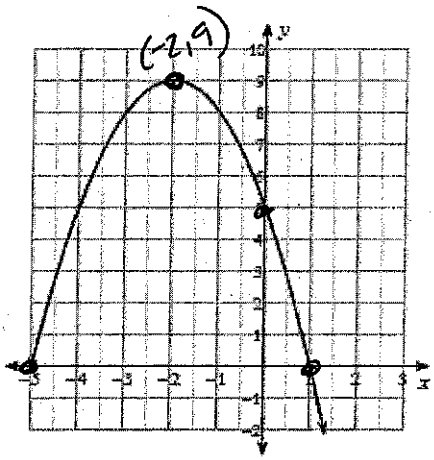
2. Equation $y = x(x+4)$
Domain: $(-\infty, \infty)$
Range: $[-4, \infty)$
x-intercept: $(-4,0)$ $(0,0)$
y-intercept: $(0,0)$
End Behavior: $x \to \infty, y \to \infty$
$x \to -\infty, y \to \infty$
Decreasing: $(-\infty, -2)$
Increasing: $(-2, \infty)$
Vertex: $(-2, -4)$
Max/Min: Min $y = -4$

$y = x(x+4)$



3. Equation $y = -x^2 - 4x + 5$
Domain: $(-\infty, \infty)$
Range: $(-\infty, 9]$
x-intercept: $(-5,0)$ $(1,0)$
y-intercept: $(0,5)$
End Behavior: $x \to \infty, y \to -\infty$
$x \to -\infty, y \to -\infty$
Decreasing: $(-2, \infty)$
Increasing: $(-\infty, -2)$
Vertex: $(-2, 9)$
Max/Min: Max $y = 9$

$y = -x^2 - 4x + 5$



Name_____ Date_____ Period_____

QUADRATIC TRANSFORMATIONS WORKSHEET

1. Write the generalized vertex form of a quadratic equation.

$y = x^2$

2. What does changing the "*a*" variable do to the graph of a quadratic function?

The "a" value impacts the width
$a > 1$ stretch $a < 1$ shrink

3. Being specific, name 3 ways that a parabola changes with different types of "*a*" values.

$y = -2(x+1)^2$ ← parabola goes down, stretch
$y = \frac{1}{2}(x-2)^2 + 1$ ← parabola shrinks
$y = x^2 - 1$ ← no change, opens up.

4. What does changing the "*h*" variable do to the graph of a quadratic function?

Impacts the horizontal shift

5. If "*h*" is positive how does the parabola move? If negative?

Right, Left if negative

6. What does changing the "*k*" variable do to the graph of a quadratic function?

vertical shift

7. If "*k*" is positive how does the parabola move? If negative?

(+) up ↓ (−) down ↓

8. What conclusion can you make about the variables of *h* and *k* together?

h and k determine the location of the vertex

Describe how the following equations transformed from $y = x^2$.

9. $y = 3x^2 - 5$ stretch 3, down 5

10. $y = \frac{1}{3}(x+1)^2$ shrink 1/3, left 1

11. $y = -2(x-3)^2 + 4$ opens down, stretch 2, Right 3, up 4

12. $y = -(x+5)^2 - 3$ opens down, Left 5, down 3