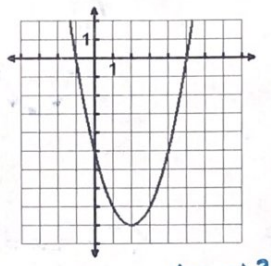
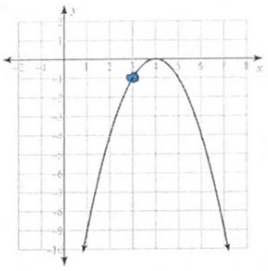
GSE Algebra I | Unit 5 – Graphing Quadratics | 5.5 - Review

Name: _____ Date: _____

Use the following to review for you test. **Work the Practice Problems on a separate sheet of paper.**

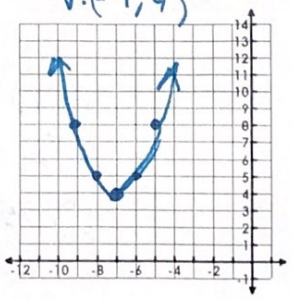
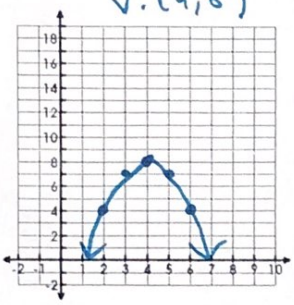
<table>
<tr><th>Topic</th><th>Things to remember</th><th colspan="2">Examples</th></tr>
<tr><td rowspan="2">Characteristics of Quadratics</td><td rowspan="2">Vertex: (h, k)

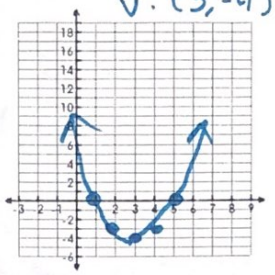
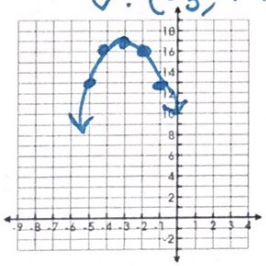
Axis of Symmetry: x = h</td><td>1. Use the graph to answer the following.
 
Equation: $y = (x-2)^2 - 9$
Vertex: $(2, -9)$
A.O.S.: $x = 2$</td><td>2. Use the graph to answer the following.
 
Equation: $y = -(x-4)^2 + 0$
Vertex: $(4, 0)$
A.O.S.: $x = 4$</td></tr>
<tr><td>Describe the transformations:
$-\frac{1}{3}f(x+2)+1$
① Reflect over x-axis
② vert shrink
③ Left 2
④ Up 1</td><td>Describe the transformations:
$f(x-4)+3$
① Right 4
② Up 3</td></tr>
<tr><td>Transformations

Negative in front reflects across x-axis

Number in front stretches or shrinks

Number inside parenthesis moves left or right

Number alone moves up or down</td><td>3. Write a quadratic equation that has been reflected and shifted right 7.
$y = -(x-7)^2$</td><td>4. Write the equation of a quadratic that has a vertex at (-5, -3), opens up, and is stretched by a factor of 2.
$y = 2(x+5)^2 - 3$</td></tr>
<tr><td>Graph Quadratics in Vertex Form</td><td>Vertex (h, k)
AOS = h
Table, Edit Function,
Start = AOS
Scroll up and down to get other ordered pairs</td><td>5. Graph the following function.
$f(x) = (x+7)^2 + 4$
V: (-7, 4)
  </td><td>6. Graph the following function.
$f(x) = -2(x-4)^2 + 8$
V: (4, 8)
  </td></tr>
</table>

Graph Quadratics in Standard Form	AOS: $x = \frac{-(b)}{2a}$ Vertex $\left(\frac{-(b)}{2a}, f\left(\frac{-(b)}{2a}\right)\right)$ Table, Edit Function, Start = AOS Scroll up and down to get other ordered pairs	7. Graph the following function. $f(x) = x^2 - 6x + 5$ $h = \frac{6}{2} = 3$ $v: (3, -4)$ 	8. Graph the following function. $f(x) = -x^2 - 6x + 8$ $h = \frac{6}{-2} = -3$ $v: (-3, 17)$ 
Change form Vertex to Standard Form	Expand the binomial. Distribute any number in front of the parenthesis. Combine like terms.	9. $f(x) = (x+2)^2 - 8$ $x^2 + 4x + 4 - 8$ $f(x) = x^2 + 4x - 4$	10. $f(x) = -3(x-5)^2 + 1$ $-3(x^2 - 10x + 25) +$ $-3x^2 + 30x - 75 + 1$ $f(x) = -3x^2 + 30x - 74$
Change from Standard Form to Vertex Form	Find a Find the h-value by using x = -b/2a Plug in the x to find the h-value Write in vertex form. **Do 11-12 by hand, and 13-14 in the calculator.**	11. $f(x) = x^2 - 2x - 8$ $a = 1$ $h = \frac{2}{2} = 1$ $k = (1)^2 - 2(1) - 8 = -9$ $y = (x-1)^2 - 9$	12. $f(x) = -2x^2 - 16x - 32$ $a = -2$ $h = \frac{16}{-4} = -4$ $k = -2(-4)^2 - 16(-4) - 32 = 0$ $y = -2(x+4)^2$
		13. $f(x) = x^2 + 10x + 20$ $a = 1 \quad h = -5 \quad k = -5$ $y = (x+5)^2 - 5$	14. $f(x) = x^2 + 6x + 9$ $a = 1 \quad h = -3 \quad k = 0$ $y = (x+3)^2$
Compare Quadratic Functions in Different Forms	Find the axis of symmetry, vertex, slope, and y-intercepts based on the equation or table given.	15. $f(x) = 2x^2 - 12x + 25$ Opens Up or Down? Up Axis of Symmetry: $x = 3$ Vertex: $(3, 7)$ Zeros: N/A y-intercept: $(0, 25)$	16. $f(x) = -(x-2)^2 + 4$ Opens Up or Down? Down Axis of Symmetry: $x = 2$ Vertex: $(2, 4)$ Solutions: $(4, 0)(0, 0)$ y- intercept: $(0, 0)$

$-(x-2)^2 + 4 = 0 \quad x-2 = 2 \quad x-2 = -2$
$(x-2)^2 = 4 \quad x = 4 \quad x = 0$