Chapter 12 Study Guide 18-19 Name _____

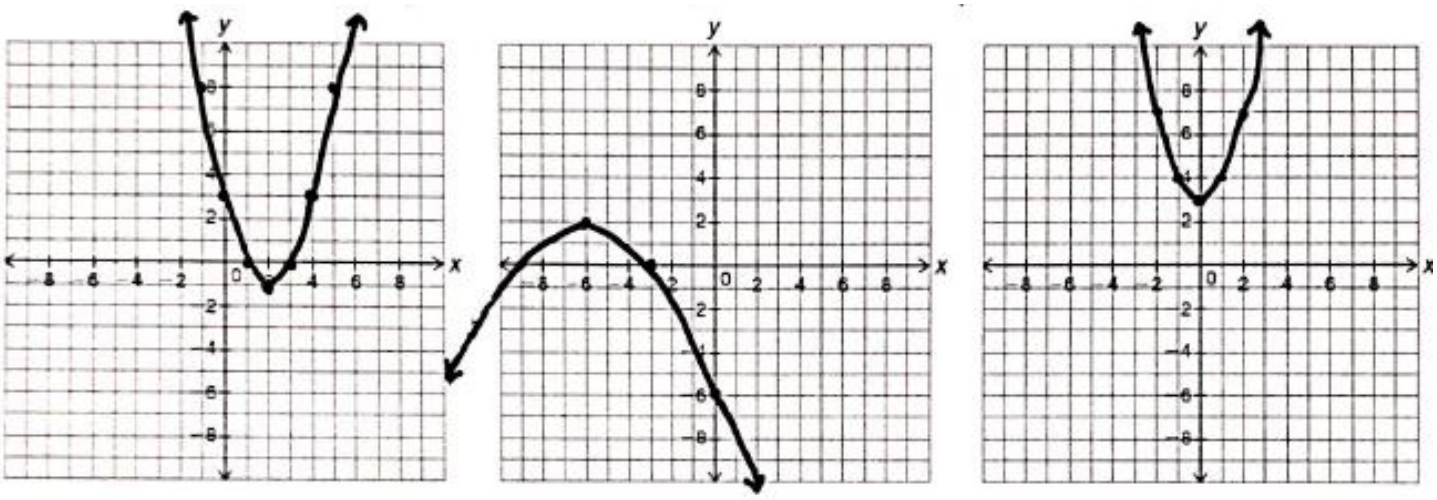
1) Write each of the forms for a quadratic function 3 times.

Standard Form	Factored Form	Vertex Form
$f(x) = ax^2 + bx + c$	$f(x) = a(x - r_1)(x - r_2)$	$f(x) = a(x - h)^2 + k$

2) Using each of the parabolas drawn below identify each of the key features listed.

(Opens up or down, Max/Min Point, Zeroes, y-intercept, Vertex, Axis of Symmetry)

(Domain, Range, Interval of Increase, Interval of Decrease)



3) Determine if the table is *linear, quadratic or neither.*

x	y
−2	−6
−1	−3
0	0
1	3
2	6

x	y
−2	12
−1	3
0	0
1	3
2	12

x	y
−3	3
−2	4
−1	5
0	6
1	7

x	y
−1	1
0	0
1	3
2	10
3	21

4) Write each function in <u>Standard Form.</u> Then identify *a*, *b*, & *c*.

$f(x) = x(x + 3)$ $f(x) = 3x(x - 8) + 5$ $g(s) = (s + 4)s - 2$ $d(t) = (20 + 3t)t$

5) Determine the y-intercept of the function in <u>Standard form.</u>

$f(x) = -4x^2 + 12x - 8$ $f(x) = 2x^2 + 18x + 16$ $f(x) = x^2 + 2x - 8$ $f(x) = -x^2 - x + 12$

6) Find the Vertex Point(x,y) of the function in <u>Standard form</u> using the formula.

$f(x) = 2x^2 - 4x - 6$ $f(x) = x^2 - 6x - 27$ $f(x) = -x^2 - 2x + 15$ $f(x) = x^2 - 10x + 24$

7) Determine each of the Zeroes of the function in <u>Factored form.</u> (Factor fully first)

$f(x) = 3(x + 4)(x - 2)$ $f(x) = 0.25(x - 1)(x - 12)$ $f(x) = (3x + 18)(x - 2)$

$f(x) = (x + 8)(3 - x)$ $f(x) = x(x + 7)$ $f(x) = (-3x + 9)(x + 3)$

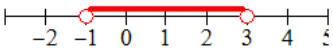
8) Write a function in <u>Factored form</u> that…

Write a quadratic function that represents a parabola that opens downward and has x-intercepts $(-5, 0)$ and $(2, 0)$.

Write a quadratic function that represents a parabola that opens upward and has x-intercepts $(3, 0)$ and $(7, 0)$.

9) Draw a parabola that has 2, 1, & 0 Zeroes.

10) Rewrite each of the following in interval notation.

a. 

b. All numbers less than or equal to 6

11) Determine the vertex of each function in <u>Vertex form</u>.

$f(x) = (x - 3)^2 + 8$ $f(x) = -2(x - 1)^2 - 8$ $f(x) = -(x + 9)^2 - 1$

$f(x) = (x - 5)^2$ $f(x) = (x + 4)^2 + 2$ $f(x) = \frac{1}{2}(x - 2)^2 + 6$

12) Write a function in <u>Vertex form</u> that ...

The vertex is $(-1, 4)$ and the parabola opens down.

The vertex is $(3, -2)$ and the parabola opens up.

13) Determine if the parabola will open upwards or downwards for each function.

$f(x) = -2(x - 1)^2 - 8$ $f(x) = 3(x + 4)(x - 2)$ $f(x) = x^2 + 2x - 8$

14) Find the Vertex Point(x,y) using the symmetric points.

$f(x) = x^2 + 4x - 12$

x-intercepts: $(2, 0)$ and $(-6, 0)$

$f(x) = -x^2 + 8x + 20$

two symmetric points on the parabola: $(-1, 11)$ and $(9, 11)$

15) Review: Solve for x.

a. $2x + 6 = 4(3x - 1)$

b. $x + 4x - 10 = -2(3x + 1)$

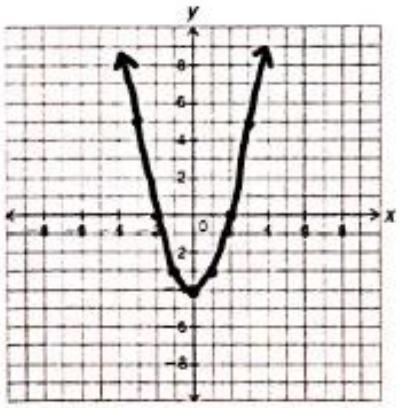
16) For each equation:

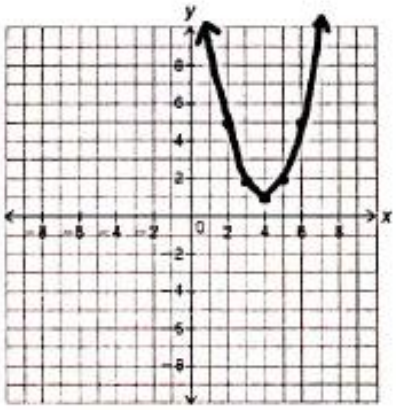
- **Describe the transformation**
- **Draw the graph**
- **Identify the vertex, y-intercept, and zeros.**

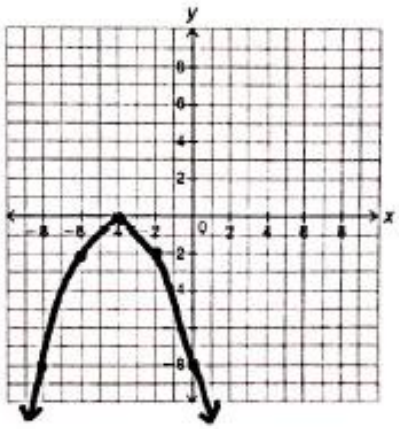
$y = (x-5)^2$ $\quad$ $y = -(x+3)^2 + 1$ $\quad$ $y = 2x^2 - 3$

$y = x^2 + 3$ $\quad$ $y = -(x+2)^2$ $\quad$ $y = (x-1)^2 - 4$

17) For each graph, find the vertex and dilation (if any).
Then, write the function that represents the graph.







18) Given four points of a parabola, graph and then write the equation of the parabola.

Vertex: (-1, 4)
Zeroes: (1,0) and (-3, 0)
y-intercept: (0, 3)

Vertex: (-1, -4)
Zeroes: (1, 0) & (-3, 0)
y-intercept: (0, -3)

19) Simplify/Evaluate.

a. $\frac{2}{3} + \frac{4}{5}$ $\quad$ **b.** $\frac{2}{7} - \frac{1}{3}$ $\quad$ **c.** $\frac{6}{5} \div \frac{1}{7}$

d. $\sqrt{45x^2}$ $\quad$ **e.** $\sqrt{180x}$ $\quad$ **f.** $\sqrt{60xy^2}$