Algebra 2 STANDARD ~ Chapter 2 Review – Part 1 (2.1-2.2)

I am KEY and today is _____ in ____ hour.

CONCEPTUAL/VOCABULARY & MATHEMATICAL REASONING

Match each with the correct description(s). There is a blank for each answer you should have.

C **a** in $f(x) = a(x - h)^2 + k$

F **h** in $f(x) = a(x - h)^2 + k$

E **k** in $f(x) = a(x - h)^2 + k$

G vertex form of a quadratic

J parabola

K, L vertex of a parabola

C. indicates a vertical stretch/shrink and/or a vertical reflection
D. indicates a horizontal stretch/shrink and/or a horizontal reflection
E. indicates vertical (up/down) shift
F. indicates horizontal (left/right) shift
G. $f(x) = a(x - h)^2 + k$
H. $f(x) = ax + b$
J. "U" shaped graph of a quadratic function
K. maximum or minimum of a quadratic graph
L the point (h, k) in the function, $f(x) = a(x - h)^2 + k$
M. $f(x) = ax^2 + bx + c$
N. none of these is correct

For each of the following functions, determine any transformations from the parent function $f(x) = x^2$ and circle ALL that apply

$a(x) = 3(x+17)^2$	translation right	translation left	translation up	translation down	vertical stretch or shrink	vertical reflection
$l(x) = -19x^2 - 47$	translation right	translation left	translation up	translation down	vertical stretch or shrink	vertical reflection
$g(x) = (x-31)^2 + 62$	translation right	translation left	translation up	translation down	vertical stretch or shrink	vertical reflection
$l(x) = -64x^2 - 19$	translation right	translation left	translation up	translation down	vertical stretch or shrink	vertical reflection
$g(x) = (x-25)^2 + 83$	translation right	translation left	translation up	translation down	vertical stretch or shrink	vertical reflection
$a(x) = 4(x+11)^2$	translation right	translation left	translation up	translation down	vertical stretch or shrink	vertical reflection

PROCEDURAL & MATHEMATICAL REASONING

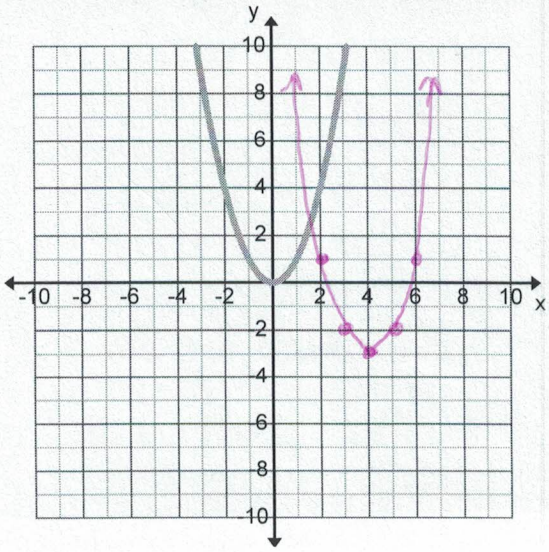
The parent function $f(x) = x^2$ is graphed. Graph the function **$g(x) = (x - 4)^2 - 3$** .

Vertex (4, -3)

Indicate (below) and label on graph at least FIVE POINTS.

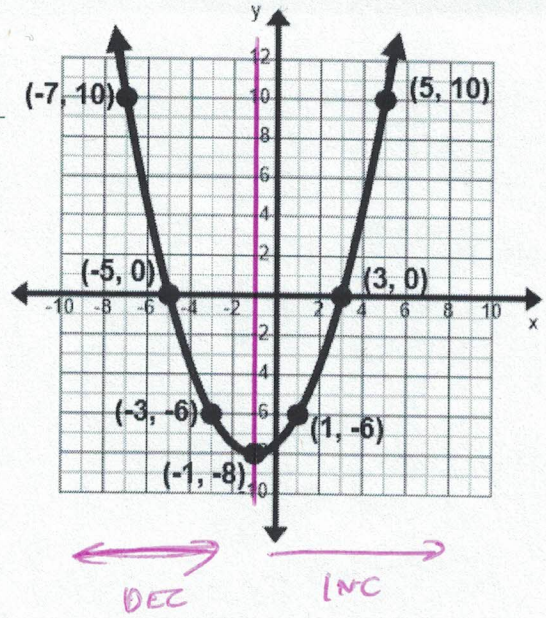
x	y	Point (x, y)
2	1	(2, 1)
3	-2	(3, -2)
4	-3	(4, -3)
5	-2	(5, -2)
6	1	(6, 1)

$y = (2-4)^2 - 3$
$y = (3-4)^2 - 3$
VERTEX
$y = (5-4)^2 - 3$
$y = (6-4)^2 - 3$



PROCEDURAL & MATHEMATICAL REASONING

The graph of $f(x) = 0.5x^2 + x - 7.5$ is shown.



Does this function have a minimum, maximum, both or neither? MINIMUM

What is the EQUATION for the AXIS OF SYMMETRY? $x = -1$

If it has a maximum or minimum, what is it? (-1 , -8)

Circle the correct statements.
There is more than one correct statement.

The function is increasing when *x* is greater than -1.

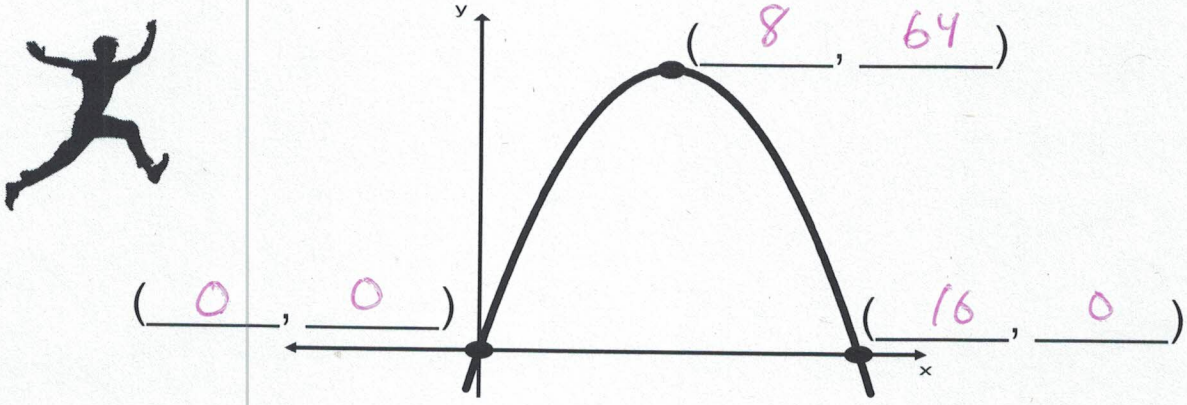
The function is decreasing when *x* is greater than -1.

The function is decreasing when *x* is less than -1.

The function is increasing when *x* is less than -1.

APPLICATION & MATHEMATICAL REASONING

Mr. Elliott's enthusiasm for Richwoods is legendary and has given him the super power to leap extraordinarily high and far. His best jump so far can be modeled by *the* equation $y = -1(x-16)(x)$ where ***x*** and ***y*** are measured in feet. It is graphed below. This is not real data. Round all values to the nearest tenth.



Identify the points shown by writing the coordinates of each.

What are the ***x***-intercepts? (0 , 0) (16 , 0)

At what point does Mr. Elliott leave the ground? (0 , 0)

At what point does Mr. Elliott return to the ground? (16 , 0)

At what point does Mr. Elliott reach his highest point? (8 , 64)

How *far* (to the nearest tenth) can Mr. Elliott leap? 16 feet

How *high* (to the nearest tenth) can Mr. Elliott leap? 64 feet

Algebra 2 STANDARD ~ Chapter 2 Review – Part 2 (2.3-2.4)

1.) Find the vertex of the parabolas below. Then state whether the vertex is a maximum or minimum.

a.) $y = 3(x+2)^2 - 5$ (h, k) $V(-2,-5)$

OPENS UP

Vertex: (-2 , -5)

Maximum or Minimum?

b.) $y = 1x^2 + 2x + 8$

OPENS UP

$x = -\frac{b}{2a}$ $x = \frac{-2}{2}$ $x = -1$

$y = (-1)^2 + 2(-1) + 8$
$y = 1 - 2 + 8$
$y = 7$

Vertex: (-1 , 7)

Maximum or Minimum?

c.) $y = 1x^2 - 4x - 32$

OPENS UP

$x = -\frac{b}{2a}$ $x = \frac{4}{2}$ $x = 2$

$y = (2)^2 - 4(2) - 32$
$y = 4 - 8 - 32$
$y = -36$

Vertex: (2 , -36)

Maximum or Minimum?

d.) $y = -3(x-4)^2 + 10$ (h, k) $V(4,10)$

OPENS DOWN

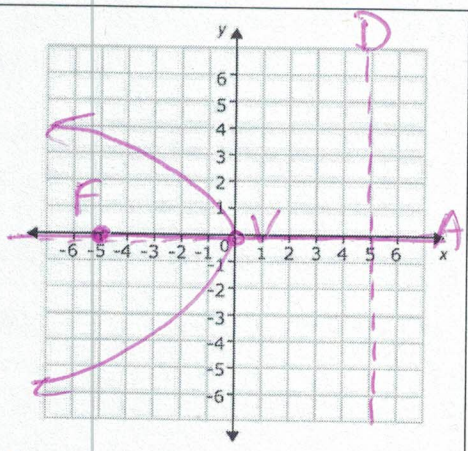
Vertex: (4 , 10)

Maximum or Minimum?

2.) Sketch a graph of the quadratic functions below. Then, write an equation for each of the parabolas. ***Make sure to clearly label the vertex, focus, axis of symmetry, and directrix.***

Focus: $(-5,0)$

Directrix: $x = 5$



Vertex? (0 , 0)

Opens? Up Down Left Right

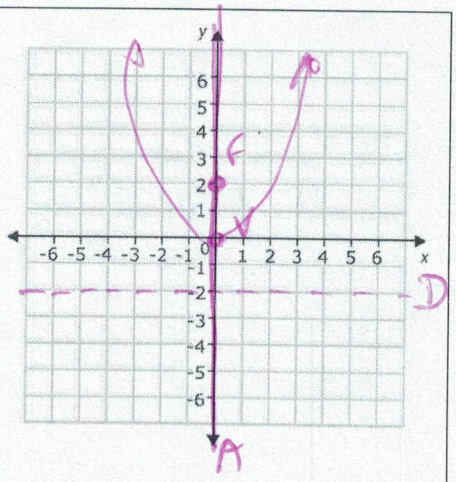
Equation Form? $y = \frac{1}{4p}x^2$ $x = \frac{1}{4p}y^2$

$p = -5$

Equation? $\boxed{x = -\frac{1}{20}y^2}$

Focus: $(0,2)$

Directrix: $y = -2$



Vertex? (0 , 0)

Opens? Up Down Left Right

Equation Form? $y = \frac{1}{4p}x^2$ $x = \frac{1}{4p}y^2$

$p = 2$

Equation? $\boxed{y = \frac{1}{8}x^2}$

3.) Given the coordinates below, write 3 equations in standard form that can be used to solve a system of equations. ***You do not have to solve the system, just write the equations!***

a.) $(1,3)$ $(2,-7)$ and $(4,20)$

$y = ax^2 + bx + c$

$(1,3) \rightarrow 3 = a(1)^2 + b(1) + c$

$\boxed{3 = a + b + c}$

$(2,-7) \rightarrow -7 = a(2)^2 + b(2) + c$

$\boxed{-7 = 4a + 2b + c}$

$(4,20) \rightarrow 20 = a(4)^2 + b(4) + c$

$\boxed{20 = 16a + 4b + c}$

b.)

Time, x	0	2	4	6
Baseball height, y	6	22	22	6

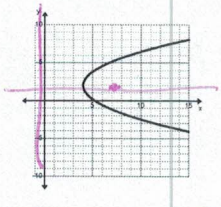
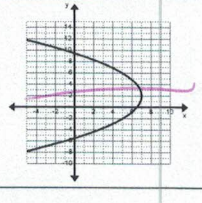
CHOOSE ANY 3 EQUATIONS BELOW

$(0,6) \rightarrow 6 = \cancel{0}a + \cancel{0}b + c$

$(2,22) \rightarrow 22 = 4a + 2b + c$

$(4,22) \rightarrow 22 = 16a + 4b + c$

$(6,6) \rightarrow 6 = 36a + 6b + c$

	Equation/Information/Graph	Which way does the parabola open?	Is the axis of symmetry horizontal or vertical?	Is the directrix horizontal or vertical?
4.)	Focus is at (-5, 0) Directrix is at $x = 5$	Up Down Left Right	Horizontal Vertical	Horizontal Vertical
5.)	$y = \frac{1}{4}(x-7)^2 - 5$	Up Down Left Right	Horizontal Vertical	Horizontal Vertical
6.)		Up Down Left Right	Horizontal Vertical	Horizontal Vertical
7.)	$x = \frac{1}{3}(y+4)^2 - 6$	Up Down Left Right	Horizontal Vertical	Horizontal Vertical
8.)		Up Down Left Right	Horizontal Vertical	Horizontal Vertical
9.)	Focus is at (0, -3) Directrix is at $y = 3$	Up Down Left Right	Horizontal Vertical	Horizontal Vertical