Algebra II
Quadratics Review #2

Name _____

1. Given: $y = -\frac{1}{2}(x+4)^2 - 1$, circle all that apply.

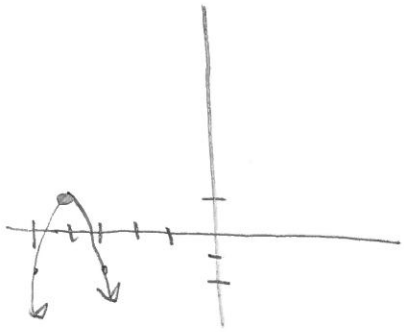
opens up/(down) (wider)/narrower (left)/right 4 up/(down) 1

Vertex: (-4, 1) Axis of Symmetry: x=-4 y-intercept: (0, -9)

Rewrite in standard form.

$y = -\frac{1}{2}x^2 - 4x - 9$

Sketch:



x	y
-4	1
-3	-3/2
-5	-3/2

2. Use the quadratic equation $y = -2x^2 - 16x + 5$ to answer the following questions.

a. Does the quadratic open up or down?
down

b. Does the parabola have a maximum or minimum value?
maximum

c. What are the coordinates of the vertex?
(-4, 37)

d. Rewrite the equation in vertex form.
$y = -2(x+4)^2 + 37$

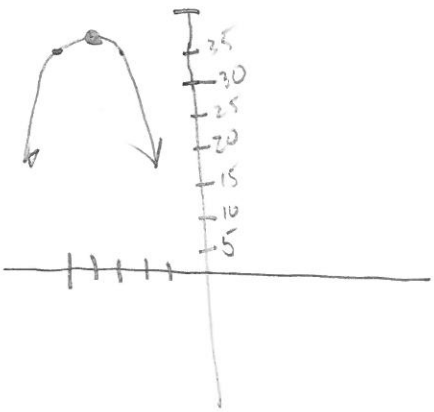
e. Identify the equation for the axis of symmetry.
$x = -4$

f. What are the coordinates of the y intercept?
(0, 5)

g. Identify the domain and range.
D: ℝ R: $y \leq 37$

h. Sketch the parabola. Make a table that has at least 3 points.

-4	37
-3	35
-5	35



3. Find the equation for the quadratic that contains the points $(0,-3), (2,7), (4,13)$. (Do this without a graphing calculator, then check your answer with the Quadratic Regression feature of your calculator)

$-3 = a(0)^2 + b(0) + c \rightarrow c = -3$

$7 = a(2)^2 + b(2) + c \rightarrow 7 = 4a + 2b - 3$

$13 = a(4)^2 + b(4) + c \rightarrow 13 = 16a + 4b - 3$

multiply by -2 $\rightarrow$ $10 = 4a + 2b$, $16 = 16a + 4b$

$-20 = -8a - 4b$

$16 = 16a + 4b$

$-4 = 8a$

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

$10 = 4(-\frac{1}{2}) + 2b$

$10 = -2 + 2b$

$12 = 2b$

$6 = b$

$y = -\frac{1}{2}x^2 + 6x - 3$

4. Write the equation for the parabola with the given features:

a. focus (-4, 3) and vertex (-4. 6)

$y = -\frac{1}{12}(x+4)^2 + 6$

b. vertex (0, 5) and directrix y= 4

$y = \frac{1}{4}x^2 + 5$

c. focus (2, 7) and directrix y=10

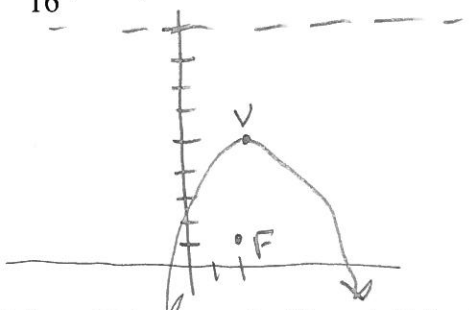
$y = -\frac{1}{6}(x-2)^2 + 8\frac{1}{2}$

5. Find the focus, directrix, vertex, and sketch. $y = -\frac{1}{16}(x-2)^2 + 5$

V (2, 5)

F (2, 1)

directrix $y = 9$



6. An object is launched into the air from a ledge 16 feet off the ground with an initial velocity of 96 feet per second. Its height H, in feet, at t seconds is given by the equation: $H = -16t^2 + 96t + 16$.

a.) What is the maximum height the object will be off the ground?

$\frac{-96}{2(-16)} = 3$

$H = -16(3)^2 + 96(3) + 16$

160 ft.

b.) How long will it take for the object to reach that height?

3 seconds