Chapter 10 Review: Quadratics

Name ______________________

VOCABULARY

1.) The graph of a quadratic function is called a parabola.

2.) Other names for the vertex are Maximum and Minimum.

Complete the table by describing how you determine each characteristic from the graph of a function and from just the equation. Be as specific as possible:

Characteristic	How do you find it on the graph?	How do you find it from the equation?
Vertex	It is the max or min point.	$x = \frac{-b}{2a}$, the plug x in to find y-coor
x-intercepts	Find where the graph crosses the x-axis	Make y zero and solve for x by factoring, quad. formula, or $\sqrt{\ }$
y-intercept	Find where the graph crosses the y-axis	"c" value
direction	Find whether graph opens up or down	Look @ "a" value. If pos, graph opens up. If neg, graph opens down.
axis of symmetry	Find x-coor. of vertex. Write as $x = \#$	x-coor. of vertex. Write as $x =$

5.) Determine the requested information about the function, including the table and graph:

a.) $y = x^2 + 4x + 4$

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

$0 = x^2 + 4x + 4$

$0 = (x+2)(x+2)$

$x = -2$

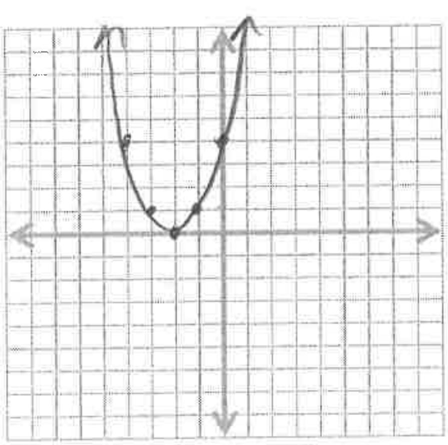
Vertex: $(-2, 0)$

x-int: $(-2, 0)$

y-int: $(0, 4)$

Direction: Up

Axis of Symm: $x = 2$



x	y
-4	4
-3	1
-2	0
-1	1
0	4

b.) $y = -x^2 + 16$

$x = \frac{0}{2(-1)}$

$x = 0$

$0 = -x^2 + 16$

$\frac{0}{-1} = \frac{-x^2}{-1} + \frac{16}{-1}$

$0 = x^2 - 16$

$0 = (x+4)(x-4)$

$x = -4, x = 4$

y

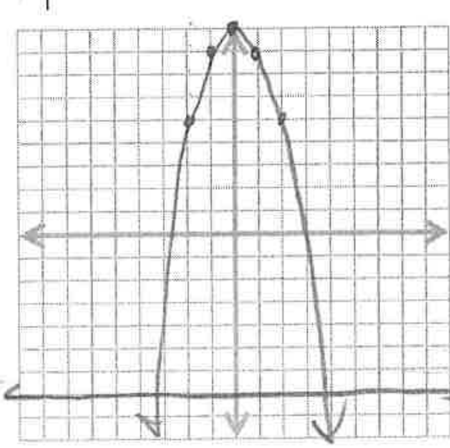
Vertex: $(0, 16)$

x-int: $(-4, 0)(4, 0)$

y-int: $(0, 16)$

Direction: Down

Axis of Symm: $y = 0$



x	y
-2	12
-1	15
0	16
1	15
2	12

If necessary, round answers to the nearest hundredth.

Solve each quadratic equation by taking square roots:

7.) $2x^2 - 20 = 78$

$2x^2 = 98$

$x^2 = 49$

$x = \pm 7$

8.) $3x^2 + 16 = 4$

$\frac{3x^2}{3} = \frac{-12}{3}$

$\sqrt{x^2} = \sqrt{-4}$

No Real Soln.

9.) $16x^2 - 6 = 3$

$\frac{16x^2}{16} = \frac{9}{16}$

$x^2 = \pm \frac{3}{4}$

Solve the quadratic equation by using the quadratic formula: $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$

10.) $3x^2 - 7x + 2 = 0$

$a=3 \quad b=-7 \quad c=2$

$x = \frac{7 \pm \sqrt{(-7)^2 - 4(3)(2)}}{2(3)}$

$x = \frac{7 \pm \sqrt{25}}{6}$

$x = \frac{7 \pm 5}{6}$

$x = \frac{12}{6} = \boxed{2}$ $\quad x = \frac{2}{6} = \boxed{\frac{1}{3}}$

11.) $5x^2 - 4x = 2$

$a=5 \quad b=-4 \quad c=2$

$5x^2 - 4x - 2 = 0$

$x = \frac{4 \pm \sqrt{(-4)^2 - 4(5)(-2)}}{2(5)}$

$x = \frac{4 \pm \sqrt{56}}{10}$

$x = \frac{(4 + 7.48)}{10} = \boxed{1.15}$

$x = \frac{(4 - 7.48)}{10} = \boxed{-.348}$

12.) $2x^2 - 5x + 2 = 0$

$a=2, b=-5, c=2$

$x = \frac{5 \pm \sqrt{(-5)^2 - 4(2)(2)}}{2(2)}$

$x = \frac{5 \pm \sqrt{9}}{4}$

$x = \frac{5 \pm 3}{4}$

$x = \frac{8}{4} = \boxed{2}$

$x = \frac{2}{4} = \boxed{\frac{1}{2}}$

10. A carnival game involves hitting a lever that sits 3 feet off the ground with a mallet to force a weight up a tube, in order to strike a bell at the top. If the player strikes the lever with a velocity of 32 ft/sec, then the height of the weight follows the equation

$h(t) = -16t^2 + 32t + 3$

A. What is the maximum height that the weight reaches?

$x = \frac{-32}{2(-16)}$

$x = 1$

$h = -16(1)^2 + 32 + 3$

$\boxed{h = 19 \text{ ft.}}$

B. If the bell is 20 ft off the ground, does the player make the bell ring? Explain.

No, it's max height is 19

C. How long does it take for the weight to come back to the lever, which sits 3 ft off the ground?

$3 = -16t^2 + 32t + 3$

$0 = -16t^2 + 32t$

$0 = -16t(t-2)$

$-16t = 0 \quad t - 2 = 0$

$t = 0 \quad \boxed{t = 2 \text{ seconds}}$