

Review for Test

1)

Quadratic Function	Vertex	Max/Min; Value	y-intercept	Axis of Symmetry
$y = -3x^2 + 6x + 8$	$(1, 11)$	11	8	$x = 1$
Related Quadratic Equation $-3x^2 + 6x + 8 = 0$	Roots (show work) between -1, 0 between 2, 3	$x = \frac{-6 \pm \sqrt{36 - 4(-3)(8)}}{-6} = \frac{-6 \pm \sqrt{132}}{-6} = -6 \pm 2\sqrt{33}$		$\frac{-3 \pm \sqrt{33}}{-3}$

2)

Quadratic Function	Vertex	Max/Min; Value	y-intercept	Axis of Symmetry
$f(x) = x^2 + 6x + 4$	$(-3, -5)$	-5	4	$x = -3$
Related Quadratic Equation $0 = x^2 + 6x + 4$	Roots (show work) between -6, -5 between -1, 0	$x = \frac{-6 \pm \sqrt{36 - 4(1)(4)}}{2} = \frac{-6 \pm \sqrt{20}}{2}$		$\frac{3 \pm \sqrt{33}}{3}$ $\frac{-6 \pm 2\sqrt{5}}{2}$

3)

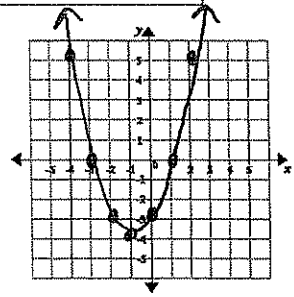
Quadratic Function	Vertex	Max/Min; Value	y-intercept	Equation for Axis of Symmetry				
$y = -7x + x^2 + 6$	$(3.5, -6.25)$	-6.25	6	$x = 3.5$				
Related Quadratic Equation $x^2 + 6 = 7x$	Roots (show work) $\{1, 6\}$	<table border="1" style="margin-left: auto; margin-right: auto;"> <tr><td>1</td><td>0</td></tr> <tr><td>6</td><td>0</td></tr> </table>		1	0	6	0	$\frac{-3 \pm \sqrt{5}}{2}$
1	0							
6	0							

$\{-3, 1\}$

4)

Solve by Graphing: $x^2 + 2x - 3 = 0$

-4	5
-3	0
-2	-3
-1	-4
0	-3
1	0



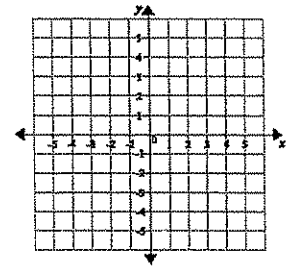
$\{\frac{5}{3}, -2\}$

5)

Solve by Factoring: $3x^2 + x = 10$

$(3x-5)(x+2) = 0$

Solve using the Quadratic Formula: $2x^2 - 6x + 3 = 0$
 $x = \frac{6 \pm \sqrt{36 - 4(2)(3)}}{4} = \frac{6 \pm \sqrt{12}}{4} = \frac{6 \pm 2\sqrt{3}}{4}$



$\{\frac{3 \pm \sqrt{3}}{2}\}$

6)

Solve using the Quadratic Formula: $x^2 - 14x = 5$
 $x = \frac{14 \pm \sqrt{196 - 4(1)(-5)}}{2} = \frac{14 \pm \sqrt{216}}{2} = \frac{14 \pm 6\sqrt{6}}{2}$

$\{7 \pm 3\sqrt{6}\}$

7)

Solve using any method; show work. $4x^2 - 12x + 9 = -4$
 $4x^2 - 12x + 13 = 0$

No Real Roots

8)

Solve using any method; show work. $x^2 + 25 = -10x$
 $x^2 + 10x + 25 = 0$
 $(x+5)(x+5) = 0$

$\{-5\}$

9)

6/6

10) $y = -5 + 6x + 3x^2$	y-intercept -5	Axis of Symmetry: $x = -1$
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11) $f(x) = -2(x-3)^2 + 4$	Vertex: $(3, 4)$	Direction of Opening: $Down$
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12) $y = 2x^2 - 5$	Vertex: $(0, -5)$	Max/Min? Value: -5
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$v_0 = 72$
 $= -32$
 $\Rightarrow 2.25$

13) Use the formula $h(t) = v_0 t - 16t^2$, where $h(t)$ is the height of an object in feet, v_0 is the object's initial velocity in feet per second, and t is the time in seconds. Chunie throws a football with an initial upward velocity of 72 feet per second. Ignoring his height, how long, to the nearest tenth of a second, after he releases the ball will it hit the ground?

4.5 sec

Highest 81 ft

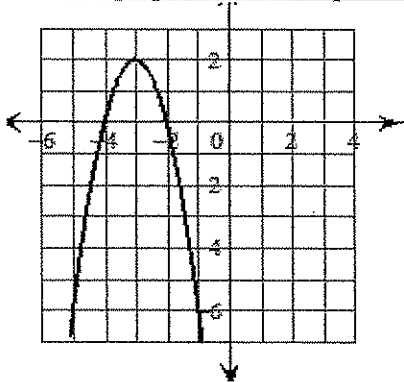
$= -20$
 $= -10$
 $x = 0$

14) The height h of the ball is given by $h = 1.2 + 20t - 5t^2$, where t is in seconds. If the ball is caught at the same height at which it was hit, how long is it in the air?
Retrieved from: <http://www.physicsforums.com/showthread.php?t=158327>

4 sec

Highest 24.2 ft

Use the graph to answer questions all part of question 15.



- 15a) Name the vertex. $(-3, 2)$
- 15b) What is the equation of the axis of symmetry? $x = -3$
- 15c) Does it have a maximum or minimum? Value? 2
- 15d) Is the coefficient of the quadratic term pos or neg? 2
- 15e) Name the zeros of the function.

$\{-4, -2\}$

Understanding Quadratics

- 16) Given the function: $y = 2(x-3)^2 - 5$. State the vertex. $(3, -5)$
- 17) Write an equation in the form $ax^2 + bx + c = 0$ that has the roots -3 and 5. $x^2 - 2x - 15 = 0$
 $(x+3)(x-5) = 0$
- 18) If a quadratic equation only has 1 solution (double root), what do you know about the graph of the related quadratic function? $Vertex \text{ is on the } x\text{-axis}$
- 19) If you know the graph of a quadratic function opens downward and has the vertex $(5, -2)$: Does it have a maximum or minimum? What do you know about the zeros of the function? $No \text{ Real Zeros}$
- 20) Given: The axis of symmetry is $x = 4$. The maximum value is -3 . If opens down. Name 2 facts that you know about the quadratic function. $The \text{ vertex is } (4, -3)$.
- 21) What does the discriminant tell you about the roots: if negative, then no real roots if positive & perfect square, then 2 rational roots
- 22) What is the graph of a quadratic function called? $parabola$