Name _____ *Key* _____

TEST DATE _____

To perform well on the Cumulative Test of Chapters 9 & 10 you need to be able to:

- ☐ graph a quadratic function
- ☐ solve quadratic equations
- ☐ solve quadratic equation real-world application problems

Can you...	Do these problems on another sheet of paper.	Where to review:
graph a quadratic function?	$y = 2x^2 - 4x + 3$ 1. determine graph direction *Opens upward.* 2. identify the a, b, c values $a = 2 \quad b = -4 \quad c = 3$ 3. find axis of symmetry $x = \dfrac{-(-4)}{2(2)} = \dfrac{4}{4} \quad x = 1$ 4. find the vertex $y = 2(1)^2 - 4(1) + 3$ $= 2 - 4 + 3 = 1 \quad (1,1)$ 5. table of values $\begin{array}{c|c} x & y \\ \hline -1 & 9 \\ 0 & 3 \\ 1 & 1 \\ 2 & 3 \\ 3 & 9 \end{array}$ 6. sketch graph 	Lesson 10-1 pg 550-553 Lesson 10-2 pg 557-558
solve a quadratic equation?	7. $2x^2 - 7 = 1$ $\dfrac{+7 \quad +7}{\dfrac{2x^2 = 8}{2} \ \dfrac{}{2}} \Big\} \rightarrow \sqrt{x^2} = \sqrt{4} \quad x = \pm 2$ 8. $10x^2 - 3 = -13x$ $10x^2 + 13x - 3 = 0 \quad x = -\dfrac{3}{2}$ $(2x+3)(5x-1) = 0$ $ x = \frac{1}{5}$ 9. $-2x^2 + 3x - 1 = 0 \quad x = \frac{1}{2}$ $2x^2 - 3x + 1 = 0$ $(2x-1)(x-1) = 0 \quad x = 1$	3 useful methods *(square roots)* Lesson 10-3 pg 566 *(factoring & zero-product property)* Lesson 10-4 pg 572-573 *(quadratic formula)* Lesson 10-6 pg 583-587
solve a quadratic real-world application?	$h = -16t^2 + c$ 10. An apple hangs from the tree 20 feet above the ground. Little Joey throws a rock at the apple causing it to fall to the ground. How long will it take for the apple to hit the ground? $0 = -16t^2 + 20$ $\dfrac{-20 -20}{-20 = -16t^2}$ 	Lesson 10-1 pg 553 *Example #5*

$\dfrac{-20}{-16} = \dfrac{-16t^2}{-16}$

$\sqrt{\dfrac{5}{4}} = \sqrt{t^2}$

$\pm 1.118033989 = t$

$\pm 1.12 \approx t$

It would take 1.12 seconds to hit the ground.

1

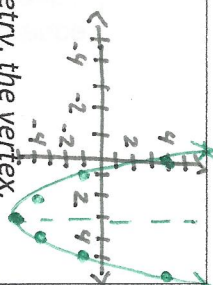a.) Is the vertex of $y = \frac{1}{2}x^2 + 5$ a maximum or a (minimum)?

b.) Is the vertex of $y = -4x^2 + 7$ a (maximum) or a minimum?

2

Graph the equation.
(Find the axis of symmetry, the vertex, and set up a table of values.)

$$y = x^2 - 6x + 4$$

$x = \frac{6}{2} = 3$

vertex $(3, -5)$

$y = 3^2 - 6(3) + 4$

$y = 9 - 18 + 4 = -9 + 4 = -5$

x	y
0	4
1	-1
2	-4
3	-5
4	-4
5	-1

3

Suppose a set of keys is dropped from a height of 35 feet. Using the equation $h = -16t^2 + 35$ (where h is height in feet at time t in seconds), how long will it take for the keys to hit the ground?

$0 = -16t^2 + 35$
$-35 \quad -35$
$\frac{-35}{-16} = \frac{-16t^2}{-16}$
$\frac{35}{16} = t^2$
$2.1875 = t^2$
$\sqrt{1.4791...} = \sqrt{t^2}$
$1.4791... = t$

It will take 1.48 seconds to hit the ground.

4

Solve each equation.

a.) $3n^2 - 27 = 0$
$ +27 \ +27$
$3n^2 = 27$
$\frac{3n^2}{3} = \frac{27}{3}$
$n^2 = 9$
$n = \pm 3$

b.) $x^2 - 7x + 5 = 0$
$x = \frac{7 \pm \sqrt{49 - 4(1)(5)}}{2}$
$x = \frac{7 \pm \sqrt{49 - 20}}{2}$
$x = \frac{7 \pm \sqrt{29}}{2}$
$x = \frac{7 + 50.99}{2}$ or $x = \frac{7 - 50.99}{2}$
$\quad 28.995 \qquad\qquad -21.995$

5

Solve the equation.

$$2x^2 - 3 = -5x$$

$2x^2 + 5x - 3 = 0$
$(2x - 1)(x + 3) = 0$
$x = \frac{1}{2}$ or $x = -3$

6

Simplify the expression.

$$15\sqrt{28n^2}$$

$15\sqrt{4 \cdot 7 \cdot n^2}$
$15 \cdot 2 \cdot n\sqrt{7}$
$30n\sqrt{7}$

7

Simplify the expression.

$$5\sqrt{\frac{7x^{54}}{9x}} = \frac{5\sqrt{7x^4}}{\sqrt{9}}$$

$= \frac{5x^2\sqrt{7}}{3}$

8

Simplify the expression.

$$6\sqrt{20} - \sqrt{45} + 8\sqrt{5}$$

$6\sqrt{4 \cdot 5} - \sqrt{9 \cdot 5} + 8\sqrt{5}$
$6 \cdot 2\sqrt{5} - 3\sqrt{5} + 8\sqrt{5}$
$12\sqrt{5} - 3\sqrt{5} + 8\sqrt{5}$
$17\sqrt{5}$

9

Simplify the expression.

$$\sqrt{5}(3\sqrt{10} + 9)$$

$3\sqrt{50} + 9\sqrt{5}$
$3\sqrt{25 \cdot 2} + 9\sqrt{5}$
$3 \cdot 5\sqrt{2} + 9\sqrt{5}$
$15\sqrt{2} + 9\sqrt{5}$