Cumulative Summary & Review
DIFF-ALGEBRA Chapters 10

Name Key

TEST DATE _____

To perform well on the Cumulative Test of Chapter 10 you need to be able to:

- ☐ graph a quadratic function or inequality
- ☐ 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? Graph a quadratic inequality?	1. $y = 2x^2 - 4x + 3$ 2. $y < 2x^2 - 4x + 3$ a. determine graph direction b. decide if the vertex is a max or min c. predict graph width (narrow/wide) d. identify the a, b, c values e. find axis of symmetry f. find the vertex g. table of values h. sketch graph Can discuss on Monday if needed.	Lesson 10-1 pg 550-553 Lesson 10-2 pg 557-559
Solve a quadratic equation?	3. $2x^2 - 7 = 1$ $2x^2 = 8$ $x = \pm 2$ $x^2 = 4$ 4. $10x^2 - 3 = -13x$ $10x^2 + 13x - 3 = 0$ $x = -\frac{3}{2}$ $(2x+3)(5x-1) = 0$ $x = \frac{1}{5}$ 5. $-1(-2x^2 + 3x - 1) = (0)(-1)$ $2x^2 - 3x + 1 = 0$ $x = \frac{1}{2}$ $(2x-1)(x-1) = 0$ $x = 1$ 6. $x^2 + 8x + 4 = 0$ $x = \frac{-8 \pm \sqrt{64 - 4(1)(4)}}{2}$ $x = \frac{-8 \pm \sqrt{64-16}}{2}$ → $x = \frac{-8 \pm \sqrt{48}}{2}$ $x \approx \frac{-8 \pm 6.93}{2}$ → $x \approx \frac{-8+6.93}{2}$ or $x \approx \frac{-8-6.93}{2}$ $x \approx -0.54$ or $x \approx -7.15$	3 useful methods Lesson 10-3 pg 566 *(square roots)* Lesson 10-4 pg 572-573 *(factoring & zero-product property)* Lesson 10-6 pg 583-587 *(quadratic formula)*
Solve a quadratic real-world application?	$h = -16t^2 + c$ 7. 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? $0 = -16t^2 + 20$ $-20 \quad -20$ $\frac{-20}{-16} = \frac{-16t^2}{-16}$ $\frac{5}{4} = t^2$ → $\pm 1.12 \approx t$ $1.25 = t^2$ It will take about 1.12 seconds to hit the ground.	Lesson 10-1 pg 553 *Example #5*

1 Use $y = -\frac{1}{2}x^2 + 5$ for the following questions.

a.) Is the vertex of a maximum or a minimum?

b.) How was the parent graph $y = x^2$ shifted? $y = -\frac{1}{2}x^2 + 5$

will open downward
will be wider
will shift upward 5 units

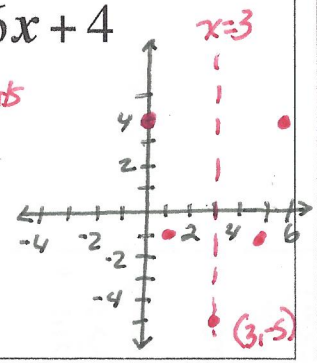
2 Graph the inequality.

$$y \geq x^2 - 6x + 4$$

axis of sym: $x = 3$

vertex: $(3, -5)$

other points: $(0, 4)$, $(1, -1)$, $(2, \ )$



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, $-35 = -16t^2$, $\frac{-35}{-16} = \frac{-16t^2}{-16}$, $\frac{35}{16} = t^2$, $\sqrt{2.1875} = \sqrt{t^2}$, $\pm 1.479 = t$

It will take 1.48 seconds to hit the ground.

4 Solve each equation.

a.) $3n^2 + 24 = 3$

$-24 \quad -24$

$\frac{3n^2}{3} = \frac{-21}{3}$

$\sqrt{n^2} = \sqrt{-21}$

No Solution

b.) $4x^2 + 3x - 8 = 0$

$x = \frac{-3 \pm \sqrt{9 - 4(4)(8)}}{8}$

$x = \frac{-3 \pm \sqrt{9 - 128}}{8}$

$x = \frac{-3 \pm \sqrt{-119}}{8}$

No Solution

5 Solve each equation.

a.) $2x^2 - 3 = -5x$

$2x^2 + 5x - 3 = 0$

$(2x - 1)(x + 3) = 0$

$x = \frac{1}{2}$ or $x = -3$

b.) $x^2 + 7x + 12 = 0$

$(x + 3)(x + 4) = 0$

$x = -3$ or $x = -4$

6 Simplify each expression.

a.) $15\sqrt{28n^2}$

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

$5 \cdot 2 \cdot n \cdot \sqrt{7}$

$30n\sqrt{7}$

b.) $5\sqrt{\frac{7}{11}} = \frac{5}{1} \cdot \frac{\sqrt{7}}{\sqrt{11}}$

$= \frac{5\sqrt{7}}{\sqrt{11}} \cdot \frac{\sqrt{11}}{\sqrt{11}}$

$= \frac{5\sqrt{77}}{\sqrt{121}}$

$= \frac{5\sqrt{77}}{11}$

7 Simplify each expression.

a.) $\sqrt{22m^5} \cdot \sqrt{50m}$

$\sqrt{22m^4m} \cdot \sqrt{25 \cdot 2 \cdot m}$

$m^2\sqrt{22m} \cdot 5\sqrt{2m}$

$5m^2\sqrt{44m^2}$

$5m^2\sqrt{4 \cdot 11 \cdot m^2}$

$5 \cdot 4 \cdot m^2 \cdot m\sqrt{11}$

$20m^3\sqrt{11}$

b.) $\sqrt{5}\left(3\sqrt{10} + 9\right)$

$3\sqrt{50} + 9\sqrt{5}$

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

$3 \cdot 5\sqrt{2} + 9\sqrt{5}$

$15\sqrt{2} + 9\sqrt{5}$

8 Simplify each expression.

$$\left(\sqrt{7} + \sqrt{2}\right)\left(2\sqrt{7} - 3\sqrt{2}\right)$$

$2\sqrt{49} \quad -3\sqrt{14} + 2\sqrt{14} \quad -3\sqrt{4}$

$2 \cdot 7 \quad - \sqrt{14} \quad - 3 \cdot 2$

$14 \quad - \sqrt{14} \quad - 6$

$8 - \sqrt{14}$

9 Simplify each expression.

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

$6\sqrt{4 \cdot 5} - \sqrt{9 \cdot 5} + 8\sqrt{5}$

$6 \cdot 2\sqrt{5} - 3\sqrt{5} + 8\sqrt{5}$

$12\sqrt{5} - 3\sqrt{5} + 8\sqrt{5}$

$17\sqrt{5}$