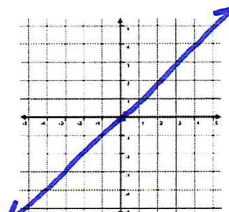
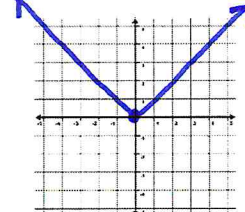
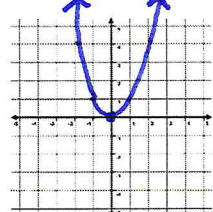
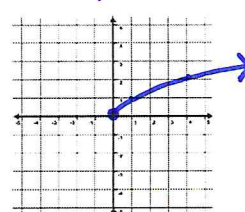
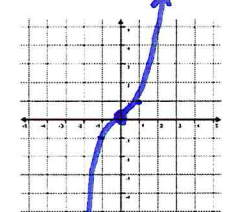
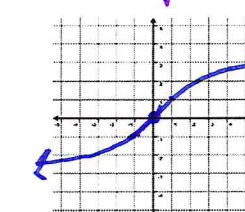
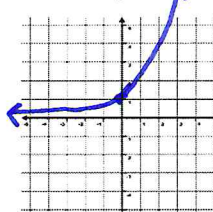
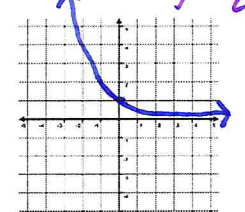


Name: Key Hour: **ALGEBRA 2 SEMESTER 1 FINAL REVIEW**

Unit 1: Function Family

1) **NC** Draw a rough sketch of each of the parent functions

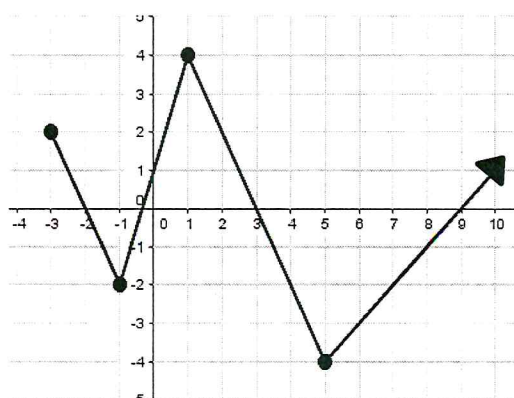
a) Linear Equation: $y = x$ 	b) Absolute Value Equation: $y = x $ 	c) Quadratic Equation: $y = x^2$ 	d) Square Root Equation: $y = \sqrt{x}$ 
e) Cubic Equation: $y = x^3$ 	f) Cube Root Equation: $y = \sqrt[3]{x}$ 	g) Exponential Growth Equation: $y = 2^x$ 	h) Logarithmic Equation: $y = \frac{1}{2}x$ Exp. Decay 

2) **NC** $g(x) = b(x-m)^2 + r$

What happens to the function when....

$ b > 1$ vertical stretch	$m > 0$ horizontal shift right	$r > 0$ vertical shift up
$0 < b < 1$ vertical compression	$m < 0$ horizontal shift left	$r < 0$ vertical shift down
$b < 0$ reflects over the x-axis		

3) **NC** Find the requested information for the graph below. Make sure you use the correct parentheses and/or brackets.



Increasing:

$(-1, 1) \cup (5, +\infty)$

Decreasing:

$(-3, -1) \cup (1, 5)$

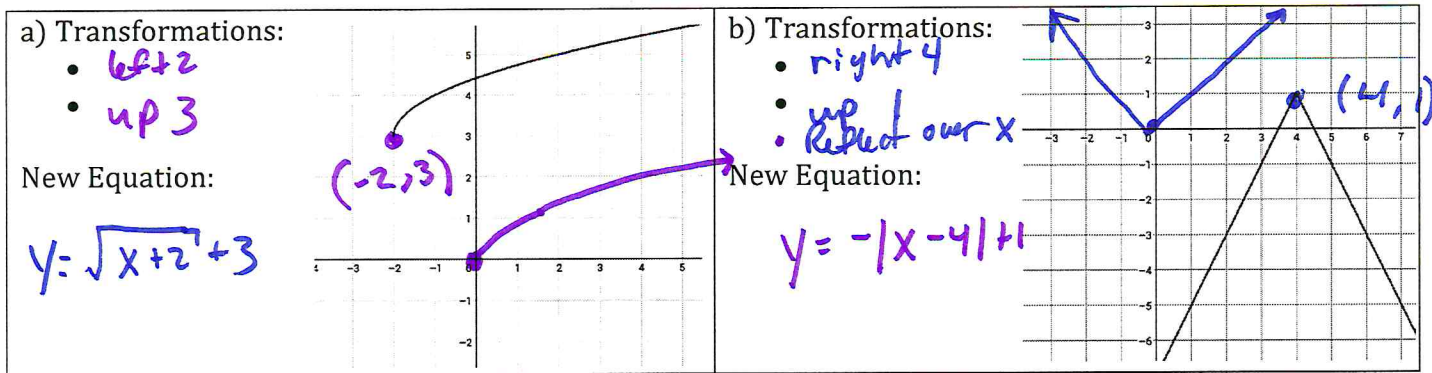
Domain:

$[-3, +\infty)$

Range:

$[-4, +\infty)$

4) **NC** For each graph below, list the transformations. Then, write the equation of the graph.



5) Find the domain & range for the following 2 functions: (Hint: It might help to draw a rough sketch!)

a) $f(x) = 3(x-2)^2 - 5$

Domain: $(-\infty, +\infty)$

Range: $[-5, +\infty)$

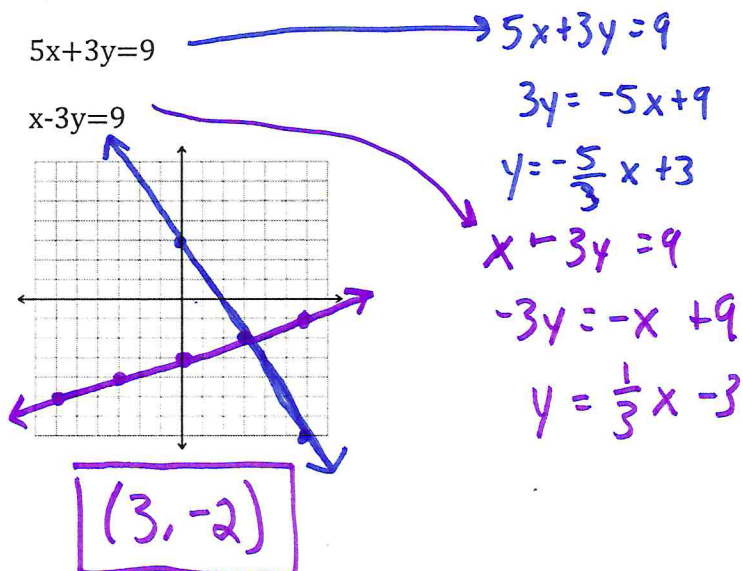
b) $g(x) = \sqrt{x-5} + 2$

Domain: $[5, +\infty)$

Range: $[2, +\infty)$

Unit 2: Systems

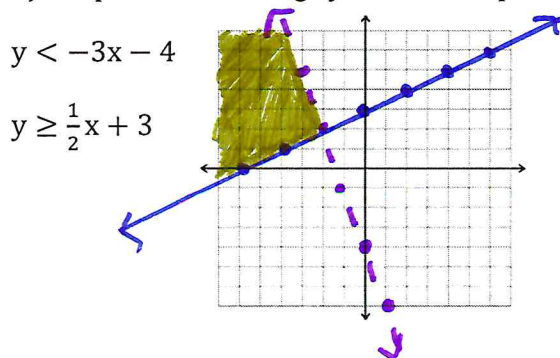
1) **NC** Solve the system by graphing.



2) **NC** Solve the system using any method.

$$\begin{array}{rcl}
 -2(5x + y = 9) & \Rightarrow & -10x - 2y = -18 \\
 10x + 2y = 20 & & 10x + 2y = 20 \\
 \hline
 0 = 2 & & \text{No Solution}
 \end{array}$$

3) Graph the following system of inequalities.



4) Are the points below a solution to

$5x + 3y \geq 9$?

a. (-2, 10) b. (2, -3) c. (4, 3) d. (1, 1)

Yes No Yes No

* Plug each point in and check to see if the result is true.

5) Maria is hosting a party. She places an order at Pizza Hut for 5 pizzas and 4 breadsticks for a total of \$51. Halfway through the party, she realizes that she will need one more pizza and 2 more order of breadsticks. This time she was given a total of \$15. How much does a pizza cost? How much does a breadstick cost?

$x = \text{cost of pizza}$
 $y = \text{cost of breadstick}$

$$\begin{aligned} 5x + 4y &= 51 \\ -5(x + 2y &= 15) \end{aligned} \Rightarrow$$

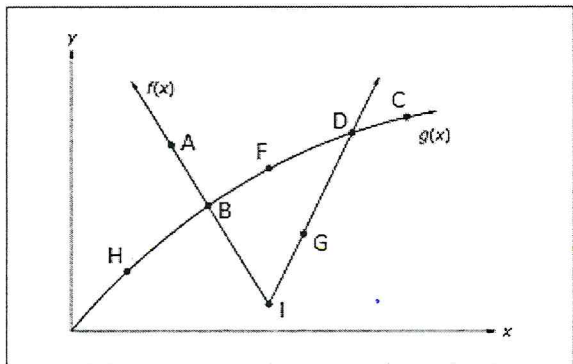
$$\begin{aligned} 5x + 4y &= 51 \\ -5x - 10y &= -75 \\ \hline -6y &= -24 \\ y &= 4 \\ x + 2(4) &= 15 \\ x + 8 &= 15 \\ x &= 7 \end{aligned}$$

pizza cost \$7
 breadsticks cost \$4

6) NC Janelle is selling cookies (x) and brownies (y) at a bake sale. A cookie costs \$1.50 and a brownie costs \$2.00. She makes \$50 profit by selling 20 items. Write a system of linear inequalities to model this problem. (You don't have to solve)

$$\begin{aligned} 1.50x + 2y &= 50 \\ x + y &= 20 \end{aligned}$$

7) The graphs of $y = f(x)$ and $y = g(x)$ are shown. A.REI.D.11



Solutions for...	List <u>all</u> the points (2 pts each)
$y = f(x)$	A, B, E, G, D
$y = g(x)$	H, B, F, D, C
$f(x) = g(x)$	B, D

8) Find where the system intersects: $f(x) = x^2 + 5x - 10$; $g(x) = x + 2$

$$x^2 + 5x - 10 = x + 2$$

$$-6 + 2 = -4$$

$$(-6, -4)$$

$$x^2 + 4x - 12 = 0$$

$$2 + 2 = 4$$

$$(2, 4)$$

$$(x + 6)(x - 2) = 0$$

$$x = -6 \quad x = 2$$

* Hint: Graph in your calculator and find the intersections.

Unit 3: Quadratics

1) Which of the following equations shows the minimum or maximum of $h(x)$? Is it a max or min?

$$h(x) = 2(x+3)(x+1)$$

min

$$h(x) = 2(x+2)^2 - 2$$

min

$$h(x) = 2x^2 + 8x + 6$$

min

2) Factor to find the x-intercepts

a) $x^2 - 13x + 30 = 0$

$$(x-15)(x-2) = 0$$

$$\boxed{x=15} \quad \boxed{x=2}$$

b) $x^2 + 5x - 14 = 0$

$$(x+7)(x-2) = 0$$

$$\boxed{x=-7} \quad \boxed{x=2}$$

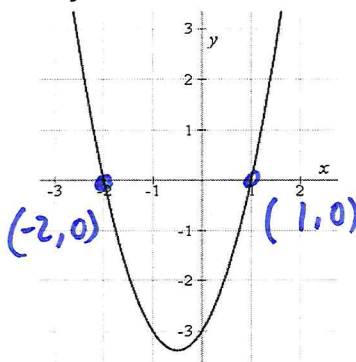
3) NC The graph below can be represented by which of the following equations:

a) $y = (x-2)(x+1)$

b) $y = (x-1)(x+2)$

c) $y = (x+1)(x+2)$

d) $y = (x-1)(x-2)$



4) NC Select all of the functions that can represent the following graph:

a) $2x^2 + 4x + 3$

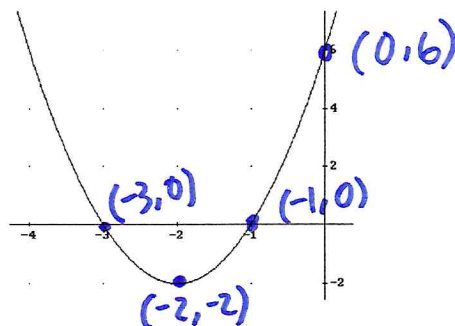
b) $2(x+3)(x+1)$

c) $2(x+2)^2 - 2$

d) $2(x-3)(x-1)$

e) $2x^2 + 8x + 6$

f) $2(x-2)^2 - 2$



5) NC Solve the following equations using any method.

a) $\sqrt{(p-6)^2} = 9$

$$p-6=3 \quad p-6=-3$$

$$\boxed{p=9}$$

$$\boxed{p=3}$$

b) $x^2 - 11x + 19 = -5$

$$x^2 - 11x + 24 = 0$$

$$(x-8)(x-3) = 0$$

$$\boxed{x=8} \quad \boxed{x=3}$$

c) $x^2 + 4x + 6 = 0$

$$x = \frac{-4 \pm \sqrt{(4)^2 - 4(1)(6)}}{2(1)}$$

$$= \frac{-4 \pm \sqrt{-8}}{2} = \frac{-4 \pm 2i\sqrt{2}}{2}$$

$$= \boxed{-2 \pm i\sqrt{2}}$$

6) How many times does each of the following functions intersect the x-axis?

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

2

b) $f(x) = \frac{4}{3}x^2 - 4x + 3$

1

c) $f(x) = 2x^2 - \frac{1}{2}x + \frac{3}{2}$

0

Unit 4: Rational/Radical

1) NC Simplify: $36^{\frac{1}{2}} = \sqrt{36} = \boxed{\pm 6}$

2) NC Simplify: $8^{\frac{2}{3}} = \sqrt[3]{8^2} = (\sqrt[3]{8})^2 = (2)^2 = 4$

3) NC Convert to radical form: $X^{\frac{4}{5}}$

$\sqrt[5]{X^4}$

4) NC Convert to exponential form: $(\sqrt[4]{X})^3$

$X^{3/4}$

5) NC Simplify:

a) $\sqrt{72} = \sqrt{36 \cdot 2} = \boxed{\pm 6\sqrt{2}}$

b) $\sqrt{200} = \sqrt{100 \cdot 2} = \boxed{\pm 10\sqrt{2}}$

6) Simplify: $X^{\frac{2}{3}} \cdot X^{\frac{3}{4}}$

$= X^{\frac{2}{3} + \frac{3}{4}} = X^{\frac{8}{12} + \frac{9}{12}}$

$= \boxed{X^{\frac{17}{12}} \text{ OR } \sqrt[12]{X^{17}}}$

7) NC Simplify: $\frac{w^2xy^{-3}z}{w^5x^3y^3z^{-4}}$

8) NC Simplify: $\frac{x^{-3}y^2z}{x^2y^{-7}z}$

$= \frac{y^2z y^7}{x^2z x^3} = \boxed{\frac{y^9}{x^5}}$

$\frac{w^2xzz^4}{w^5x^3y^3y^3} = \frac{w^2xz^5}{w^5x^3y^6} = \frac{w^{-3}x^{-2}z^5}{y^6} = \boxed{\frac{z^5}{w^3x^2y^6}}$

9) NC Solve: $\frac{(x+8)(4)}{(x+8)(x)} + \frac{(-3)x}{(x+8)x}$

10) Solve $\frac{x^2+11x+30}{x^2+3x-18} = \frac{(x+6)(x+5)}{(x+6)(x-3)} = \boxed{\frac{x+5}{x-3}}$

$= \frac{4x+32-3x}{(x+8)(x)} = \boxed{\frac{x+32}{(x+8)(x)}}$

11) $\sqrt{3x-5} = 7$

$3x-5 = 49$

$3x = 54$

$\boxed{x=18}$

Check: $\sqrt{3(18)-5} = 7$
 $\sqrt{54-5} = 7$
 $\sqrt{49} = 7$
 $7 = 7 \checkmark$

12) $\sqrt{90-x} = x$

$90-x = x^2$

$0 = x^2+x-90$

$0 = (x+10)(x-9)$

$\boxed{x=-10}$ $\boxed{x=9}$
 extraneous

Check

$\sqrt{90+10} = -10$
 $\sqrt{100} = -10$
 $10 \neq -10$
 $\sqrt{90-9} = 9$
 $\sqrt{81} = 9$
 $9 = 9 \checkmark$

13) $\sqrt{x-5} = \sqrt{10-2x}$

$x-5 = 10-2x$

$3x = 15$

$\boxed{x=5}$

Check: $\sqrt{5-5} = \sqrt{10-2(5)}$
 $\sqrt{0} = \sqrt{0} \checkmark$