Algebra 1

Unit 2A/3B Review

Name:_____

Date:_____ Block:_____

Linear & Quadratic Functions Unit Review

What you need to know & be able to do	Things to remember	Examples	
1. Determine if a relation is a function.	Every input only has one output (each 'x' only has one 'y') Use the vertical line test on graphs.	a. Determine if the graph is a function. 	b. Determine if the table represents a function. | x	y
---	---
-1	4
0	5
2	6
-1	7	
2. Domain and Range	Domain: y- values Range: x – values	 Domain: Domain: Domain: Range: Range: Range:	
3. Create an input-output table for a function.	"x-y chart" – choose the x-values & plug them in	a. Create an input-output table for the function $f(x) = 2x - 3$. Use x = -2, -1, 0, 1, and 2. | x	f(x) = 2x - 3
---	---
-2	
-1	
0	
1	
2			a. Evaluate f (4). $$f(x) = x^2 + 3x - 1$$ f (4) = b. Find the value of $f(x) = 4x - 2$ when $x = -1$.
4. Evaluate functions.	f(x) function notation f(2) means you must substitute a '2' for every 'x' in the function!		

5. Write a function.		a. Which function is modeled by this table? **(Hint: Find the slope and y-int)**	b. Write the equation of the line the corresponds to the following table:

a. table:

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

b. table:

x	f(x)
4	9
8	12
16	18
32	30

---

5. Create a function & use it to solve a problem.

a. You join a kickboxing class at a local gym. The cost is $5 per class plus $30 for the initial membership fee. Write a rule for the total cost of the class as a function of x. How much will it cost if you attend 7 classes?

b.

Time Worked (h)	1	2	3	4
Amount Earned f(h)	5	10	15	20

---
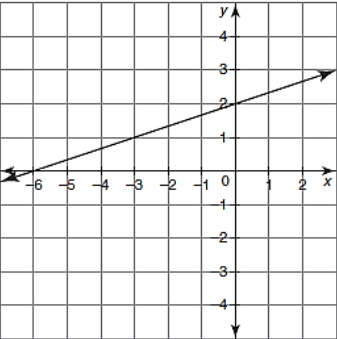
6. Calculate the average rate of change (slope).

"slope"

$$\frac{rise}{run}$$

$$m = \frac{y_2 - y_1}{x_2 - x_1}$$

$$\frac{\text{Change in y}}{\text{Change in x}}$$

a. Calculate the slope. Then write the equation of the line.

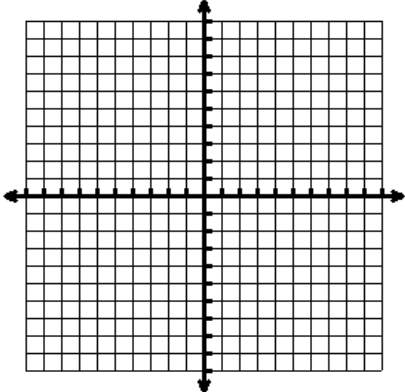b. Calculate the average rate of change (slope) between the following points on a line.
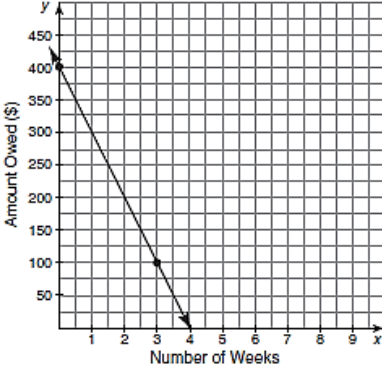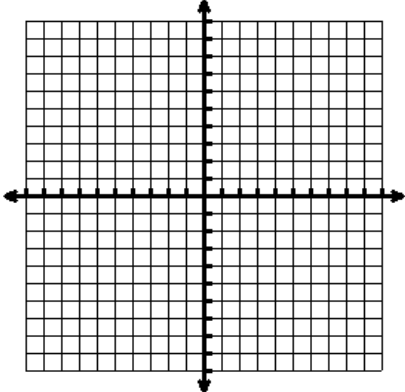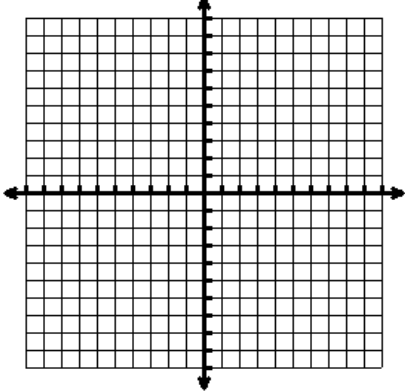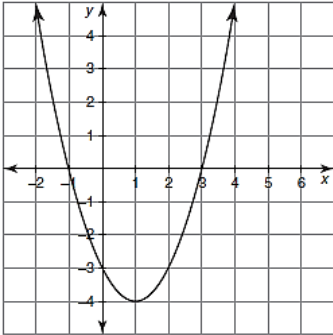
(0, 4) & (-3, 10)

c. Calculate the slope. Give a labeled answer.

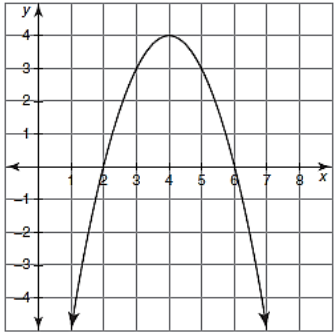| Number of Balloons	Total Cost of Balloons (in Dollars)
2	6
4	12
6	18
8	24

d. Calculate the slope. Give a labeled answer.

Television

7. Graph in vertex form	1. Determine your vertex. 2. Create a table with 2 values to the left and right of the vertex. 3. Graph.	a. Graph the following equation: $y = -3(x-2)^2 + 5$
8. Graph in standard form	1. Determine your vertex $\left(x = \dfrac{-b}{2a}\right)$. 2. Create a table with 2 values to the left and right of the vertex. 3. Graph.	a. Graph the following equation: $y = x^2 + 4x + 7$
9. Graph in factored form	1. Determine your x-intercepts and plot them. 2. Determine you vertex (find the middle of the two x-intercepts or use $x = \dfrac{p+q}{2}$). 3. Plot vertex and graph.	a. Graph the following equation: $y = -(x+1)(x-5)$

10.. Different Forms of Quadratics	Vertex Form: $y = a(x-h)^2 + k$ (h, k) is vertex Standard Form: $y = ax^2 + bx + c$ (0, c) is y-intercept	a. Determine the form and associated characteristics: $y = 2(x+4)(x-3)$	b. Determine the form and associated characteristics: $y = (x-5)^2 + 9$

	Factored Form: $y = a(x - p)(x - q)$ $(p, 0)$ & $(q, 0)$ are x-intercepts A determines if graph opens up or down	c. Determine the form and associated characteristics: $y = -x^2 + 6x - 1$	d. Determine the form and associated characteristics: $y = -(x + 2)^2$
11. *Converting between forms*	Use your Converting Between Forms graphic organizer.	a. What characteristics can you describe in $y = (x + 4)(x - 7)$? Convert to standard form. What new characteristic can you give?	b. What characteristics can you describe in $y = (x + 3)^2 - 5$ Convert to standard form. What new characteristic can you give?
		c. What characteristics can you describe in $y = x^2 + 6x + 4$ Convert to vertex form. What new characteristic can you give?	d. What characteristics can you describe in $y = x^2 - 5x - 24$ Convert to factored form. What new characteristic can you give?
12. *Create equations given characteristics*	Determine the best form to represent the given characteristics	a. Given: X-intercepts of $(7, 0)$ and $(-8, 0)$ and graph opens up	b. Given: Vertex of $(-3, -6)$ and graph has a maximum
13. *Create equations given graphs*		a. Vertex Form: Intercept Form: Standard Form:	b. Vertex Form: Intercept Form: Standard Form:

14. Applications of the Vertex	Maximum/Minimum indicate finding the vertex. Describe what you know about your equation before completing any solving. Interpret the vertex in terms of what x and y represent.	a. The height in feet of a rocket after x second is given by $y = -16x^2 + 128x$. What is the maximum height reached by the rocket and how long does it take to reach that h eight?	b. The arch of bridge is modeled by the equation $y = -\frac{1}{4}(x - 50)^2 + 95$, where x represent the horizontal distance (in feet) and y represents the vertical distance (in feet). What is the maximum height of the arch?
15. Converting to Vertex Form by Completing the Square		a. $y = x^2 + 4x + 5$ List the Vertex: ( )	b. $y = 2x^2 + 8x - 12$ List the Vertex: ( )