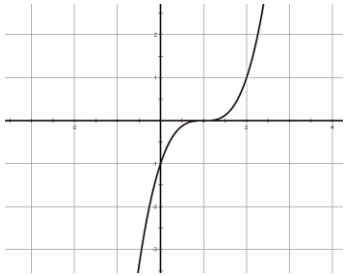
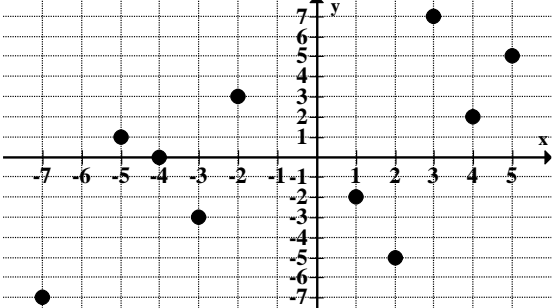


**Unit 2B Review - Linear Functions**

What you need to know & be able to do	Things to remember	Examples											
<p>1. Determine if a relation is a function.</p>	<p>Every input only has one output (each 'x' only has one 'y')</p> <p>Use the vertical line test on graphs.</p>	<p>1. Determine if the graph is a function.</p> 	<p>2. Determine if the table represents a function.</p> <table border="1"> <thead> <tr> <th>x</th> <th>y</th> </tr> </thead> <tbody> <tr> <td>-1</td> <td>4</td> </tr> <tr> <td>0</td> <td>5</td> </tr> <tr> <td>2</td> <td>6</td> </tr> <tr> <td>-1</td> <td>7</td> </tr> </tbody> </table>	x	y	-1	4	0	5	2	6	-1	7
x	y												
-1	4												
0	5												
2	6												
-1	7												
<p>2. Create an input-output table for a function.</p>	<p>"x-y chart" – choose the x-values &amp; plug them in</p>	<p>3. Create an input-output table for the function <math>f(x) = 2x - 3</math>. Use <math>x = -2, -1, 0, 1,</math> and <math>2</math>.</p>	<p>4. Create an input-output table for the function <math>f(x) = 6</math>. Use <math>x = -2, -1, 0, 1,</math> and <math>2</math>.</p>										
<p>3. Evaluate functions.</p>	<p><math>f(x)</math> function notation <math>f(2)</math> means you must substitute a '2' for every 'x' in the function!</p>	<p>5. Evaluate <math>f(4)</math>.</p> $f(x) = x^2 + 3x - 1$	<p>6. Find the value of <math>f(x) = 4x - 2</math> when <math>x = -1</math>.</p>										
		<p>7. a. Find <math>f(5)</math>.</p> <p>b. Find the value of <math>x</math> for <math>f(x) = 2</math>.</p> <p>c. What is the maximum and minimum? Write in function notation.</p>											

4. Write a function.

8.

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

9.

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

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

10. 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?

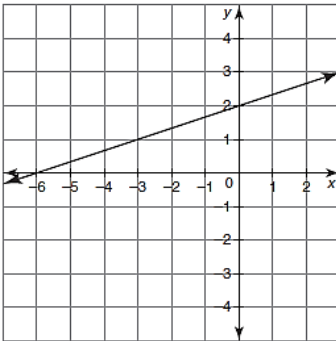
11. Air Force One can travel 630 miles per hour. Let h be the number of hours traveled. Write a function rule that represents the total number of miles traveled. Then, determine how many miles Air Force One can travel in 4 hours.

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

“slope”  

$$m = \frac{y_2 - y_1}{x_2 - x_1}$$
  
 Change in y  
 Change in x

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



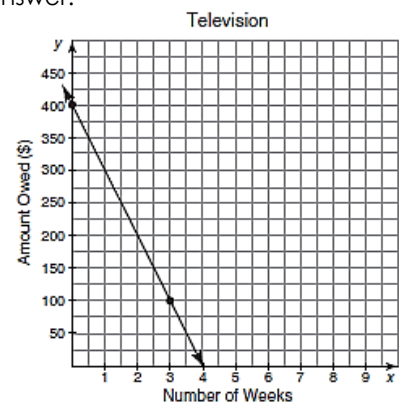
13. Calculate the average rate of change between the following points on a line.

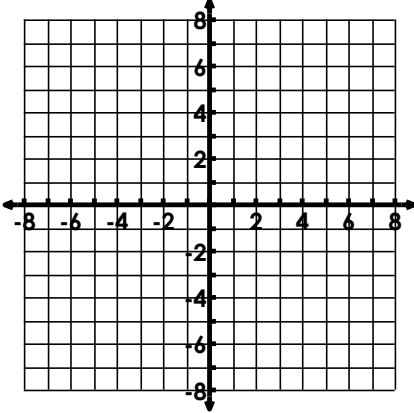
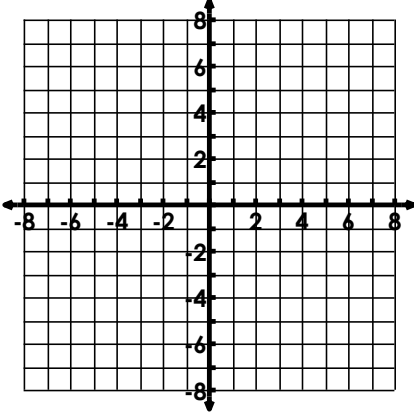
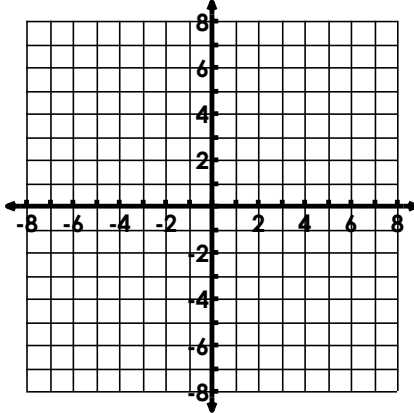
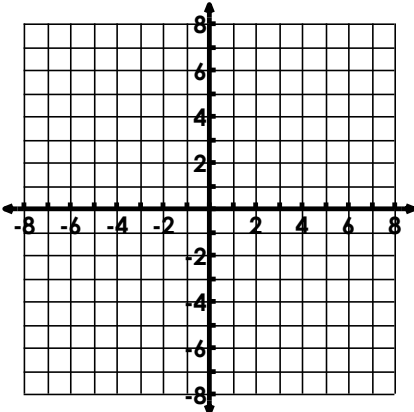
(0, 4) & (-3, 10)

14. Calculate the slope. Give a labeled answer.

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

15. Calculate the slope. Give a labeled answer.



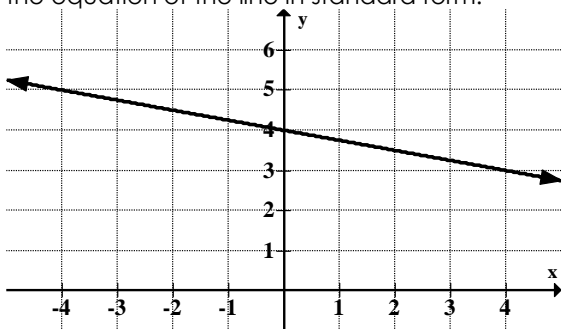
<p>7. Calculate the y-intercept</p>	<p>Point where graph crosses y-axis</p> <p>(0, b)</p>	<p>16. Name the y-intercept:</p> <table border="1"> <tbody> <tr> <td>x</td> <td>0</td> <td>1</td> <td>3</td> <td>4</td> </tr> <tr> <td>y</td> <td>8</td> <td>6</td> <td>2</td> <td>0</td> </tr> </tbody> </table>	x	0	1	3	4	y	8	6	2	0	<p>17. A photography studio charges \$50 that includes a sitting fee and 6 prints. Luigi increased his order to 11 prints and paid \$65. How much was the sitting fee?</p>
x	0	1	3	4									
y	8	6	2	0									
<p>8. Graph a linear function</p>	<p><math>y = mx + b</math></p> <p>*Always graph the y-intercept first and then use slope to determine next point.</p>	<p>18. Graph: <math>f(x) = -\frac{2}{3}x + 6</math></p> 	<p>19. Graph: <math>-4x + 2y = 12</math></p> 										
<p>9. Convert from standard to slope intercept form</p>	<p>Slope Intercept: <math>y = mx + b</math></p> <p>Standard: <math>Ax + By = C</math></p>	<p>20. Graph <math>x = -3</math>. Name slope &amp; y-intercept</p> 	<p>21. Graph <math>y = 4</math>. Name slope &amp; y-intercept.</p> 										
<p>9. Convert from standard to slope intercept form</p>	<p>Slope Intercept: <math>y = mx + b</math></p> <p>Standard: <math>Ax + By = C</math></p>	<p>22. Solve for y: <math>4x + 2y = 8</math></p>	<p>23. Determine the slope and y-intercept: <math>3x - 6y = -12</math>.</p>										

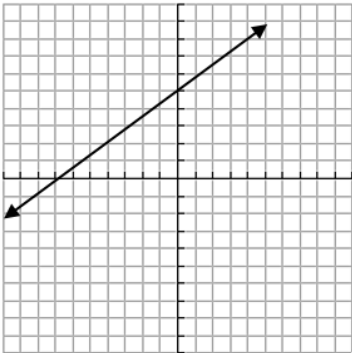
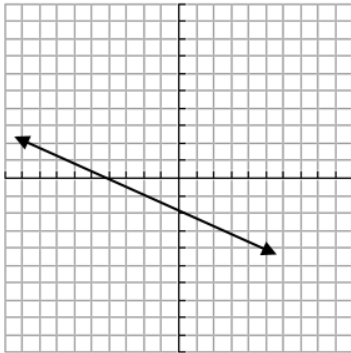
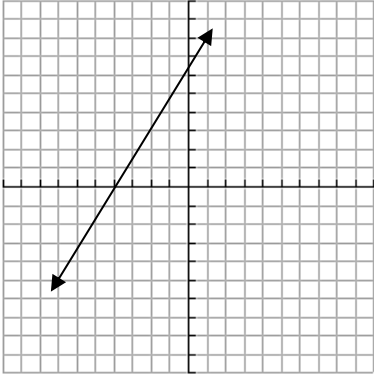
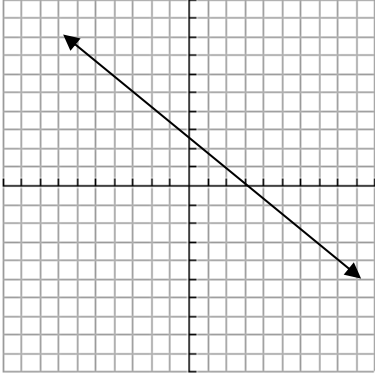
10. Convert from slope intercept to standard form	Slope Intercept: $y = mx + b$  Standard: $Ax + By = C$ (no negative A values; multiply by -1 if necessary)	24. Put in standard form: $y = 3x + 4$	25. Put in standard form: $y = -2/3x - 5$
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11. Write the equation of a line.	$y = mx + b$	26. Write the equation of the line that has a slope of $-\frac{1}{2}$ and contains the point (4, 6).	27. Write the equation of the line that contains the points (-2, 2) and (2, -6).
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		28. Write the equation of the line that has a slope of 5 and y-intercept at (0, 3).	29. Write the equation of the line the corresponds to the following table: <table border="1"> <tr> <td>x</td> <td>2</td> <td>5</td> <td>8</td> <td>11</td> </tr> <tr> <td>y</td> <td>-6</td> <td>-4</td> <td>-2</td> <td>0</td> </tr> </table>	x	2	5	8	11	y	-6	-4	-2	0
x	2	5	8	11									
y	-6	-4	-2	0									

30. Write the equation of the line that corresponds to the graph below. Then write the equation of the line in standard form.



<p>12. Determine the characteristics of linear functions</p>	<p>Domain: input, x-values, "left to right"</p> <p>Range – output, y-values, "bottom to top"</p> <p>x-intercept(s): where the graph crosses the x-axis.</p> <p>y-intercept(s): where the graph crosses the y-axis.</p> <p>maximum/minimum: the highest or lowest points.</p> <p>Increase: where the graph looks like it's going "up hill".</p> <p>Decrease: where the graph looks like it's going "down hill".</p> <p>Constant: where the graph is horizontal.</p> <p>End Behavior:  "left side" <math>x \rightarrow -\infty</math>  "right side" <math>x \rightarrow \infty</math></p> <p>What direction do the left and right arrows go?</p>	<p>31. Determine the domain &amp; range of the function.</p>  <p>Domain: _____ Range: _____</p> <p>Interval of Increase: _____</p> <p>Interval of Decrease: _____</p> <p>Maximum: _____ Minimum: _____</p> <p>End Behavior: As <math>x \rightarrow \infty</math>, <math>f(x) \rightarrow</math> _____  As <math>x \rightarrow -\infty</math>, <math>f(x) \rightarrow</math> _____</p> <p>Zeros: _____ X-Intercept: _____ Y-Intercept: _____</p>	<p>32. Determine the domain &amp; range of the function.</p>  <p>Domain: _____ Range: _____</p> <p>Interval of Increase: _____</p> <p>Interval of Decrease: _____</p> <p>Maximum: _____ Minimum: _____</p> <p>End Behavior: As <math>x \rightarrow \infty</math>, <math>f(x) \rightarrow</math> _____  As <math>x \rightarrow -\infty</math>, <math>f(x) \rightarrow</math> _____</p> <p>Zeros: _____ X-Intercept: _____ Y-Intercept: _____</p>
<p>13. Determine where the graph is positive and negative</p>	<p>For what x-values is the graph in the positive (above x-axis) region and in the negative (below x-axis) region?</p>	<p>33. Give the inequality for the parts of the graph that are positive and negative.</p>  <p>Positive: _____</p> <p>Negative: _____</p>	<p>34. Give the inequality for the parts of the graph that are positive and negative.</p>  <p>Positive: _____</p> <p>Negative: _____</p>
<p>14. Characteristics of functions without a graph.</p>	<p>X-intercept: (a, 0)  Y-intercept (0, b)</p>	<p>35. Which functions have an interval of increase? How do you know?</p> <p>A. <math>f(x) = 2x - 5</math>  B. <math>f(x) = -\frac{1}{2}x + 4</math>  C. <math>f(x) = -3x - 1</math>  D. <math>f(x) = 3x + 9</math></p>	<p>36. What are the x and y intercepts for the equation <math>3x - 6y = 24</math>?</p>

15. Creating Equations from a Word Problem	<p>Standard Form:  <math>Ax + By = C</math>            *Total            *Two different amounts</p> <p>Slope Intercept Form:  <math>y = mx + b</math>            *Rate            *Starting Amount/            One Time Fee</p>	37. Ed has \$36 to buy paints and brushes for a school project. Jars of paint cost \$4 each. The brushes are \$2 each. Write an equation to determine the combination of brushes and paint he can buy. If he buys 3 jars of paint, how many brushes can he buy?	38. Gail orders CDs for \$8 each plus a total shipping cost of \$5. Write an equation to determine the total cost of purchasing CDs. If Gail spent \$53, how many CDs did she order?															
16. Comparing Linear Functions	Determine what the slope and y-intercepts are and interpret them in a real world context before comparing.	39. Which function has the greater rate of change and y-intercept?  Function 1: $y = 2x + 3$ Function 2: $(0, 4), (1, 8), (2, 12)$	40. The table to the right shows the distance (in meters) Runner A and Runner B ran at different time intervals. Which runner has a faster average speed from 20 to 31 seconds?  <table border="1"> <thead> <tr> <th>Time</th> <th>Runner A</th> <th>Runner B</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>0</td> <td>0</td> </tr> <tr> <td>9</td> <td>120</td> <td>120</td> </tr> <tr> <td>20</td> <td>168</td> <td>213</td> </tr> <tr> <td>31</td> <td>287</td> <td>287</td> </tr> </tbody> </table>	Time	Runner A	Runner B	0	0	0	9	120	120	20	168	213	31	287	287
Time	Runner A	Runner B																
0	0	0																
9	120	120																
20	168	213																
31	287	287																
17. Arithmetic Sequences	<p>Explicit form:  <math>a_n = a_1 + (n - 1)d</math></p> <p>Recursive form:  <math>a_1 =</math>  <math>a_n = a_{n-1} + D</math></p>	41. Write the EXPLICIT and RECURSIVE formula for the following sequence: 5, 9, 13, 17...	42. Write the EXPLICIT and RECURSIVE formula for the following sequence: -3, -9, -14, -19...															
		43. Given the sequence -3, 0, 3, 6... find the following term values: $a_{19} =$ $a_{32} =$	44. Given the sequence 7, 15, 23, 31... find the following term values: $a_6 =$ $a_{24} =$															
		45. Determine the first four terms of the sequence: $a_1 = 7$ $a_n = a_{n-1} - 3$	46. Determine the first four terms of the sequence: $a_1 = -4$ $a_n = a_{n-1} + 5$															