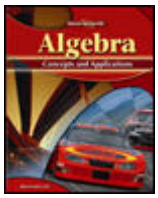
Credit Recovery for Algebra 1

1. Textbooks:



Algebra: Concepts and Applications ©2008
Glencoe Algebra: Concepts and Applications covers all the Algebra 1 concepts. This program is designed for students who are challenged by high school mathematics.

2. Curriculum:

Use the 2007 Mathematics Core Curriculum:
Algebra 1 - http://www.graniteschools.org/C7/C19/MathK-12/Algebra/CORE-ElemAlg.pdf

Follow the District 2007 Mathematics Core Curriculum Maps:
Algebra 1 - http://www.graniteschools.org/C7/C19/MathK-12/Algebra/MAPAlgebra2007.pdf

Assignments can be constructed from the Utah/Glencoe C&A correlation charts:
Algebra 1 - http://www.graniteschools.org/C7/C19/MathK-12/Algebra/AlgebraCA.pdf

Online Textbook Support (extra examples, quizzes, investigations, chapter tests, etc.):
Algebra 1 - http://www.glencoe.com/sec/math/algebra/ca/ca_05/index.php/ut

3. Credit by Quarter (as correlated to district curriculum map):

Quarter 1 Module– September and October
Quarter 2 Module– November and December
Quarter 3 Module– January and February
Quarter 4 Module– March and April

4. Assessment by Quarter:

Aligned with district Algebra Quarterly Benchmarks

Algebra 1 Credit Recovery
Algebra: Concepts and Applications © 2008

	Core Standard and Objective	Correlated Assignments
Quarter 2 Module	2.1a Identify the slope of a line when given points, a graph, or an equation. 2.1b Identify horizontal and vertical lines given the equations or slopes. 2.1c Determine the effect of changes in slope or *y*- intercept in $y = mx + b$. 2.1d Determine and explain the meaning of slopes and intercepts using real-world examples. 2.1c Determine the effect of changes in slope or *y*-intercept in $y = mx + b$. 2.1d Determine and explain the meaning of slopes and intercepts using real-world examples. 2.2a Write algebraic expressions or equations to generalize visual patterns, numerical patterns, relations, or data sets. 2.2b Represent linear equations in slope-intercept form, $y = mx + b$, and standard form, $Ax + By = C$. 2.2c Distinguish between linear and non-linear functions by examining a table, equation, or graph. 2.2d Interpret the slope of a linear function as a rate of change in real-world situations.	**Assignments:** pgs. 287-289 (3, 14, 15, 16, 17, 18, 20, 21, 24, 26, 27, 28) Worksheet 1: *Horizontal and Vertical Lines* Worksheet 2: *Zooming in on Linear Equations* (use a graphing calculator) Use a graphing calculator on page 319 pg. 319 (1, 3, 4, 5, 6, 7, 8, 9, 10, 12, 14, 16, 18, 20, 22, 24, 26, 28, 30, 31, 32); pg. 330 (32, 33, 34, 35) Worksheet 3: *Reflect and Apply* Worksheet 4: *Reasoning Linear Equations* Worksheet 5: *Identify Parts of Linear Equations* pgs. 326 (6, 7, 8, 15, 16, 17, 18, 19, 20, 21, 22, 23); pg. 330 (36, 37, 38, 39) Worksheet 6: *Patterns* pgs. 254-255 (3, 4, 5, 13, 14, 15, 16, 17, 18, 19, 20, 21); pg. 289 (30) Worksheet 7: *Linear and Nonlinear Functions* (use a graphing calculator) Worksheet 8: *Linear or NOT Tables* Worksheet 9: *Linear vs. Nonlinear* Worksheet 10: *Real Life Linear Equations*

HORIZONTAL and V Lines

Name _____

Date _____

E
R
T
I
C
A
L

Determine whether the following lines are vertical or horizontal. For questions 1-4 you may want to use a graphing calculator.

What is the *y*-intercept? What is the slope?

1. $y = 5$
2. $y + 2 = 9$
3. $y - 3 = 2$
4. Are these lines horizontal or vertical?

What is the *x*-intercept? What is the slope?

5. $x = 3$
6. $x - 6 = 3$
7. $x + 4 = 3$
8. Are these lines horizontal or vertical?

Fill in the blank.

9. If the slope is zero, the line will always be _____.
10. If the slope is undefined, the line will always be _____.

Zooming in on a Linear Equation (y = mx + b)

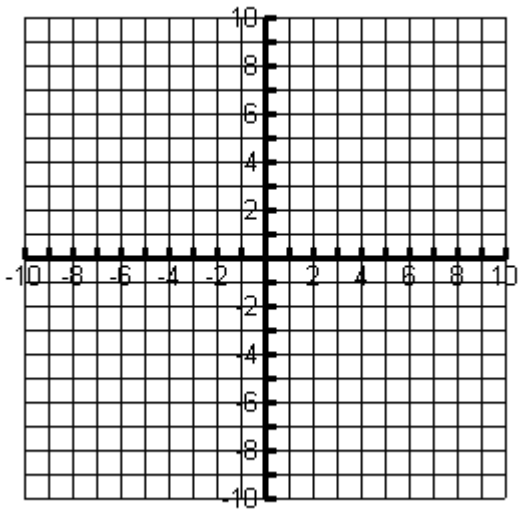
Name_____ Date _____

Use a graphing calculator to explore the slope and y-intercept of linear equations.

1. Set graphing calculator window: Xmin = - 10, Xmax = 10, Ymin = - 10, Y max = 10

2. Press y = and enter $y = x$. Press Graph. Sketch the graph below. Label the line with the equation.

3. Enter and graph the following: (you are changing the *m* in the equation $y = mx + b$.)



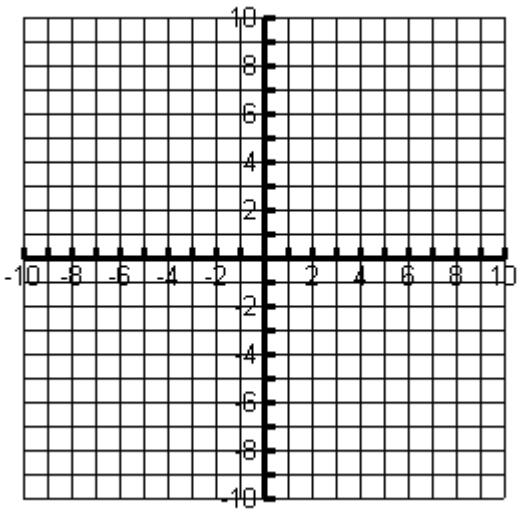
$y = 2x$	$y = 3x$	$y = 6x$
slope_____	slope_____	slope_____
y-intercept____	*y*-intercept____	*y*-intercept____

What happens to the line as *m* (the coefficient of *x*) increases?

Using your table on the graphing calculator, explain what happens to the values of *y* as *m* increases.

What do you think would happen if you made *m* negative for these four equations? (ie. $y = -x$)

4. Try it. Graph.

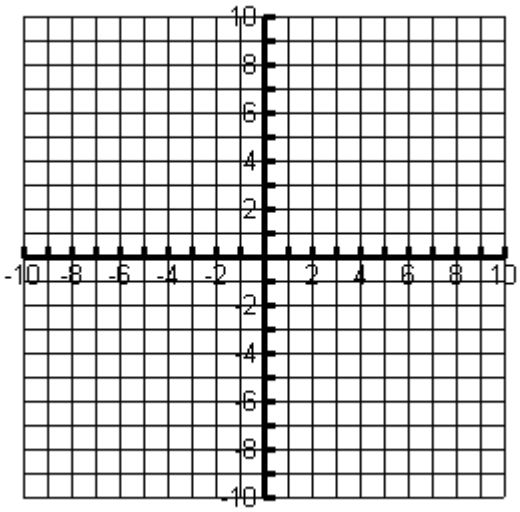


$y = -x$	$y = -2x$	$y = -3x$	$y = -6x$
slope____	slope____	slope_____	slope____
y-int____	*y*-int____	*y*-int_____	*y*-int____

Were you right? If not, then write what happened.

Using your table on the graphing calculator, explain what happens to the values of *y* when you made *m* negative.

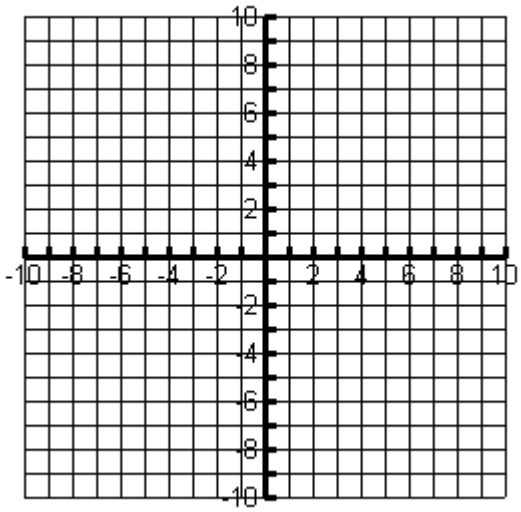
5. Enter and graph: $y = \frac{2}{3}x$, $y = \frac{1}{2}x$, $y = \frac{1}{4}x$,
$y = -\frac{2}{3}x$, $y = -\frac{1}{2}x$, $y = -\frac{1}{4}x$



How are these graphs similar to those graphed in #3 and #4?

How are these graphs different to those graphed in #3 and #4?

6. Enter and graph: $y = x$, $y = x + 1$, $y = x + 2$, $y = x + 5$
$y = x - 1$, $y = x - 2$, $y = x - 5$



What happens to the line when you change the *b* part of $y = mx + b$?

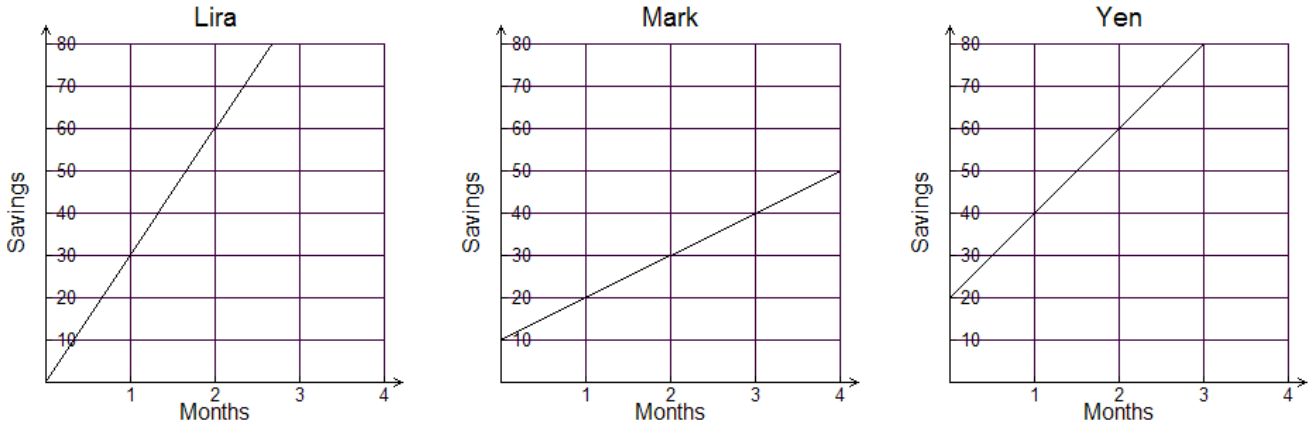
Using your table on the graphing calculator, explain what happens to the values of *y* when you changed *b*.

Reflect and Apply

Name _____ Date _____

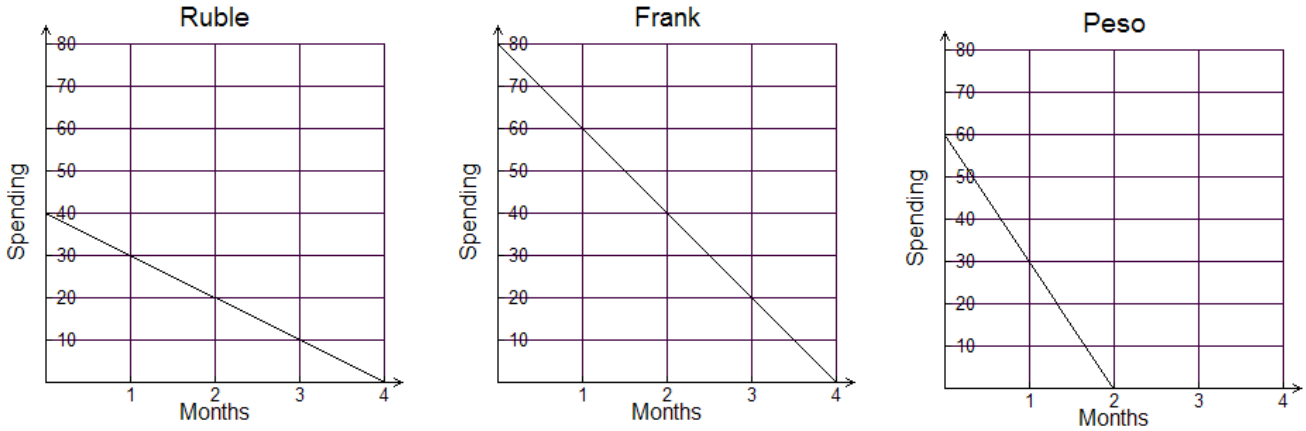
Using the graphs given, answer each question.

1. The graphs represent the savings of three students.



a. Which students started with the most money? Explain.
b. Which student started with the least Money? Explain.
c. Which student is saving the fastest? Explain.
d. Which student is the slowest? Explain.

2. The graphs represent the spending habits of three students.



a. Which student started with the most money? Explain.
b. Which student started with the least money? Explain.
c. Which student is spending the fastest? Explain.
d. Which student is spending the slowest? Explain.

Reasoning about Linear Equations

Name _____ Date _____

Examine the grid below. In each cell,

- Place an x to indicate that an equation possesses the given attribute.
- Place a question mark to indicate you are unsure.
- Leave the space blank if the equation does not possess an attribute.
- In the last two columns identify the slope and y-intercept.

Equation	***Has a Positive Slope***	***Has a Negative Slope***	***Has a Slope of Zero***	***Has an Undefined Slope***	***Has a Non-zero X-intercept***	***Has a Non-zero Y-intercept***	***Passes through the origin***	***What is the slope?***	***What is the y-intercept?***
$y = x$									
$y = 3x + 2$									
$y = \frac{1}{4}x - 7$									
$y = 7 - x$									
$y = 4$									
$x = -3$									
$y = x - 8$									
$y - 3 = -2(x + 4)$									
$y = -6$									
x = 8									
$y = 16 + \frac{2}{3}x$									
$y = -5x - 2$									
$y + 5 = \frac{1}{2}(x - 6)$									
$-x + 3y = 9$									

Identifying Parts of Linear Equations

Name _____ Date _____

For each situation below, identify the independent variable (**x**), the dependent variable (**y**), the slope (rate of change, or **m**), and the y-intercept (**b**). Write an equation to model the suggested function in the form ***y* = m*x* + b.**

1. The high temperature for the day was 25°. As evening progressed, the temperature dropped steadily 2° each hour.

    a. ***x*** represents _____
    b. ***y*** represents _____
    c. **m** represents _____
    d. **b** represents _____
    e. This linear relation can be modeled by the equation _____

2. A diver begins a steady rate of ascent from a depth of 25.5 feet. He makes his way slowly to the surface rising half a foot per second to avoid cramping.

    a. ***x*** represents _____
    b. ***y*** represents _____
    c. **m** represent_____
    d. **b** represents _____
    e. This linear relation can be modeled by the equation _____

4. Telephonics Wireless offers a plan that charges a monthly connect fee of $10 plus $0.03 per minute for calls anytime.

    a. ***x*** represents _____
    b. ***y*** represents _____
    c. **m** represents _____
    d. **b** represents _____
    e. This linear relation can be modeled by the equation _____

5. A marathon runner averages 100 meters in 20 seconds from the start line.

    a. ***x*** represents _____
    b. ***y*** represents _____
    c. **m** represents _____
    d. **b** represents _____
    e. This linear relation can be modeled by the equation _____

6. The varsity football team began the fourth quarter on their opponents 30 yard line (The 50 yard line is 0 on the y axis). During their possession of the ball, they average a 4 yard gain each down.

   a. ***x*** represents _____
   b. ***y*** represents _____
   c. **m** represents _____
   d. **b** represents _____
   e. This linear relation can be modeled by the equation _____

7. Selena has been hired in the data entry department for an insurance company. They will pay her a $100 signing bonus plus $14 per hour her first month on the job.

   a. ***x*** represents _____
   b. ***y*** represents _____
   c. **m** represents _____
   d. **b** represents _____
   e. This linear relation can be modeled by the equation _____

8. Juanita has been learning to weave on a loom. She has created a design she is very proud of. She can weave one square foot of her rug every half hour.

   a. ***x*** represents _____
   b. ***y*** represents _____
   c. **m** represents _____
   d. **b** represents _____
   e. This linear relation can be modeled by the equation _____

9. Tualo's father wants him to dig roasting pit in his yard. Tualo can remove about half a foot of earth every fifteen minutes.

   a. ***x*** represents _____
   b. ***y*** represents _____
   c. **m** represents _____
   d. **b** represents _____
   e. This linear relation can be modeled by the equation _____

Patterns Worksheet

Name _____ Date _____

Look at each of the following patterns and write an equation to represent the pattern.

Example

linear
tiles

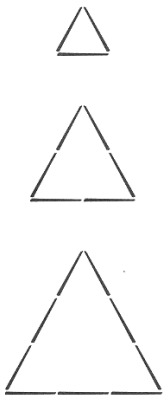
$y = 3x + 1$

Pattern 1

linear
tiles

$y =$ _____

Pattern 2



linear
toothpicks

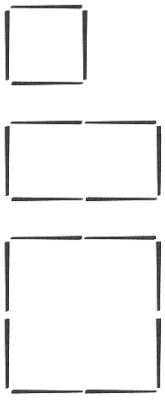
$y =$ _____

Pattern 3

linear
tiles

$y =$ _____

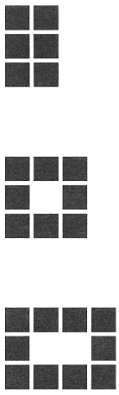
Pattern 4



linear
toothpicks

$y =$ _____

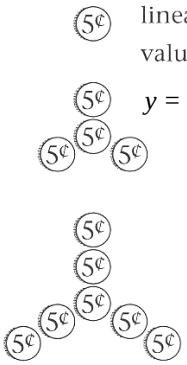
Pattern 5



linear
tiles

$y =$ _____

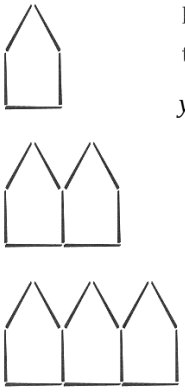
Pattern 6



linear
value

$y =$ _____

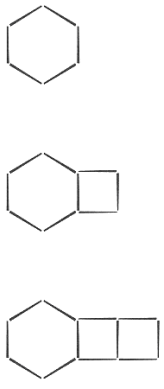
Pattern 7



linear
toothpicks

$y =$ _____

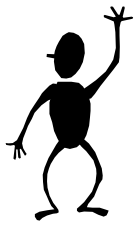
Pattern 8



linear
toothpicks

$y =$ _____

Comparing Linear and Nonlinear Functions



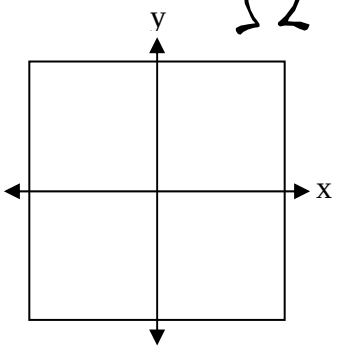
Name _____ **Date** _____

I. We know the graph of $y = mx + b$. Sketch the general appearance of the graph and complete the table for the graph $y = x$.

What do *m* and *b* represent? _____

What characteristics make the graph linear? _____

_____



II. Predict which of the equations in questions 1-5 will be linear.

_____

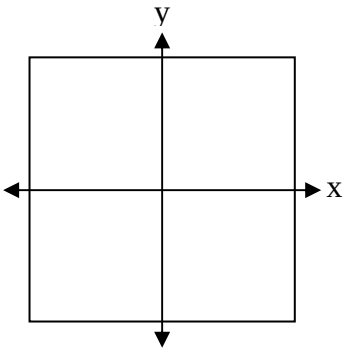
What other predictions can you make about what the graphs will look like?

_____

x	***y***
-2	
-1	
0	
1	
2	

Enter the equations into the graphing calculator and sketch the graphs below. Describe the characteristics of the equation and graph. Write any similarities and difference you observe when comparing it with the graph $y = x$.

1. $y = |x|$



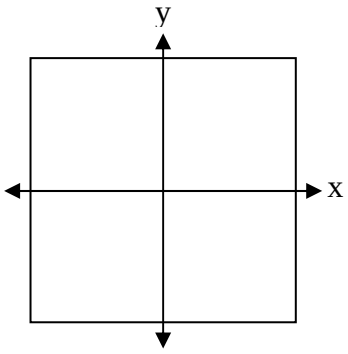
x	***y***
-2	
-1	
0	
1	
2	

Characteristics: _____
_____
_____
_____

Similarities: _____
_____

Differences: _____
_____

2. $y = x^2$



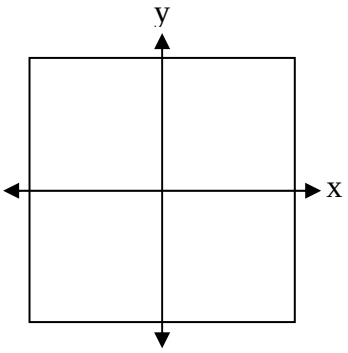
x	***y***
-2	
-1	
0	
1	
2	

Characteristics: _____
_____
_____
_____

Similarities: _____
_____

Differences: _____
_____

3. $y = \frac{1}{x}$



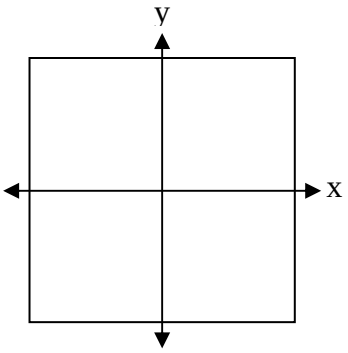
x	*y*
-2	
-1	
0	
1	
2	

Characteristics: _____
_____
_____
_____

Similarities: _____
_____

Differences: _____
_____

4. $y = \sqrt{x}$



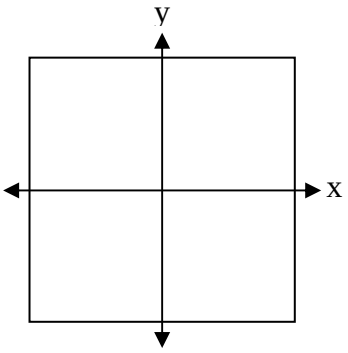
x	*y*
-2	
-1	
0	
1	
2	

Characteristics: _____
_____
_____
_____

Similarities: _____
_____

Differences: _____
_____

5. $y = 2^x$



x	*y*
-2	
-1	
0	
1	
2	

Characteristics: _____
_____
_____
_____

Similarities: _____
_____

Differences: _____
_____

Linear or NOT!!!

Name _____ Date _____

Could the tables below represent a linear relationship? ***Explain why or why not.***

Time (seconds)	**Distance (meters)**
0	0
1	2
2	4
3	8
4	16
5	32

Explanation: _____
_____
_____
_____
_____
_____

Time (seconds)	**Distance (meters)**
0	0
1	12
2	20
3	28
4	36
5	44

Explanation: _____
_____
_____
_____
_____
_____

Time (seconds)	**Distance (meters)**
0	0
1	3
2	6
3	12
4	16
5	20

Explanation: _____
_____
_____
_____
_____
_____

Time (seconds)	**Distance (meters)**
0	10
1	13
2	16
3	19
4	22
5	25

Explanation: _____
_____
_____
_____
_____
_____

Linear vs. Nonlinear

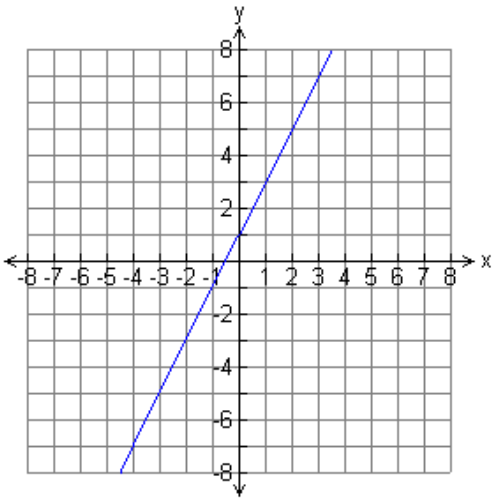
Name _____ Date _____

1. What does the graph of a linear function look like?

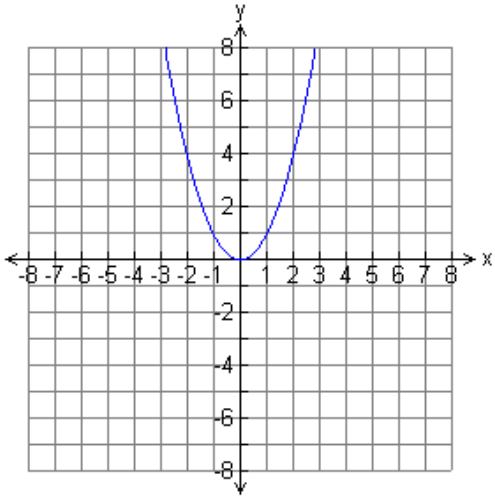
2. What does the graph of a non-linear function look like?

Look at each of the following graphs and classify them as linear or non-linear. Explain your choices.

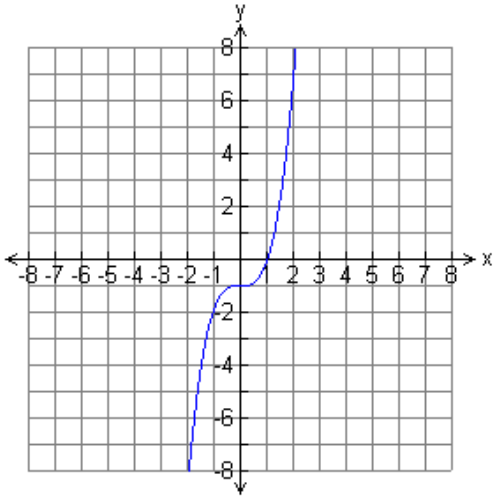
3.



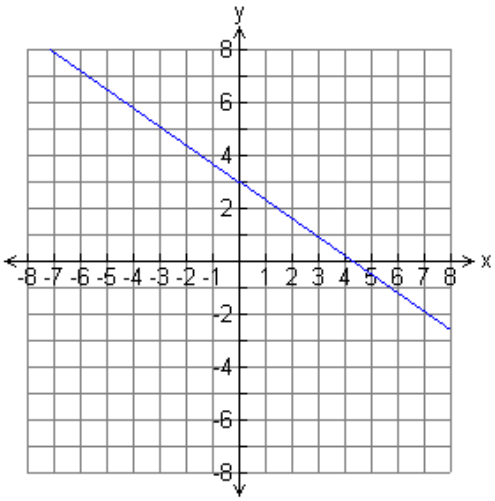
4.



5.



6.



7. What does the equation of a linear function look like?

8. What does the equation of a non-linear function look like?

Look at each of the following equations and classify them as linear or non-linear. Explain your choices.

9. $y = 2x^2 + 3x - 8$

10. $y = \frac{1}{2}x + 11$

11. $y = x^3$

12. $y = -7x$

13. $y = 4x + x^2$

14. $y = 5x^3 - 6x^2$

15. How do you tell if the table of a function is linear or non-linear?

Look at each of the following tables and classify them as linear or non-linear. Explain your choices.

16.

x	y
1	5
2	7
3	9
4	11

17.

x	y
1	1
2	4
3	9
4	16

18.

x	y
3	27
4	64
5	125
6	216

19.

x	y
-1	-7
0	-3
1	1
2	5

20.

x	y
7	41
8	55
9	71
10	89

21.

x	y
5	-2
6	-8
7	-14
8	-20

22. What is another name for x in a table of values?

23. What is another name for y in a table of values?

Real Life Linear Equations

Name _____ Date _____

Answer the following questions about real life models of linear equations.

You want to rent a rowboat for a fishing trip. It costs $8 plus $12 per day. The linear model for this situation relates the total cost of renting a rowboat, y, with the number of days rented, *x*.

1. What number corresponds to the slope in the linear model?

2. What number corresponds to the *y*-intercept in the linear model?

3. Use the slope and *y*-intercept to write the linear model.

4. Use the linear model to find the cost of renting a rowboat for 6 days.

5. If you had $50 to spend, for how many days could you rent the rowboat?

Let $y = 55x + 26$ represent the amount of money (in dollars) in your savings account from the beginning of 1988 to the end of 1998. Let *x* represent the number of years since 1988.

6. What is the rate of change in the linear model?

7. Estimate the amount of money in your savings account for 1992.

8. Estimate the amount of money in your savings account for 1998. Movie Prices In

Let $y = 0.25x + 4$ for the cost of going to a movie from 1985 to 1995. Let *x* represent the number of years since 1985.

9. What is the *y*-intercept in the linear model?

10. Estimate the cost of going to the movies in 1991.

11. Estimate the cost of going to the movies in 1997.

You have $12 to buy tomato and pepper seedlings for your garden. The tomato seedlings cost $4.00 and the pepper seedlings cost $2.00.

12. Write an equation in standard form that represents the different amounts tomato and pepper seedlings that you could buy.

13. Use the linear equation to complete the table.

Number of tomato seedlings	0	1	2	3
Number of pepper seedlings				

14. Describe the relationship between the number of tomato seedlings and the number of pepper seedlings shown in the table.