GRAPHING 9

LG 8

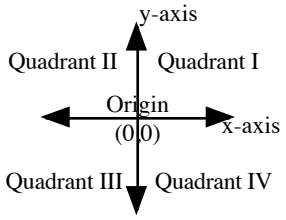
GRAPHING PACKAGE

STUDENT MATERIALS

REVISED : OCTOBER 2016

LG 8 Assignment #1 (Quadrants & Plotting Points)

The **horizontal axis** is called the **x-axis** and the **vertical axis** is referred to as the **y-axis**. The graph of an ordered pair (2, 3) is a point on the **Coordinate Plane**. The first number of an ordered pair is the x-coordinate and it tells how many units to move to the left or right from the origin (0, 0). The second number of an ordered pair is the y-coordinate and it tells how many units to move up or down form the origin. The Cartesian plane (or coordinate plane) consists of 4 **quadrants** separated by the x and y axes. The intersection of these axes is the coordinate (0,0) which is called the **origin**.

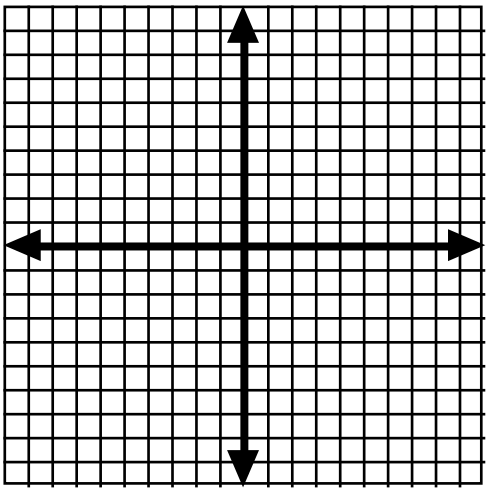


1. **Plot** the following points on the below left coordinate plane. Write above each point what quadrant is it in? Then **join** each pair of points with a line. Is the line joining the two points **horizontal** or **vertical**?:

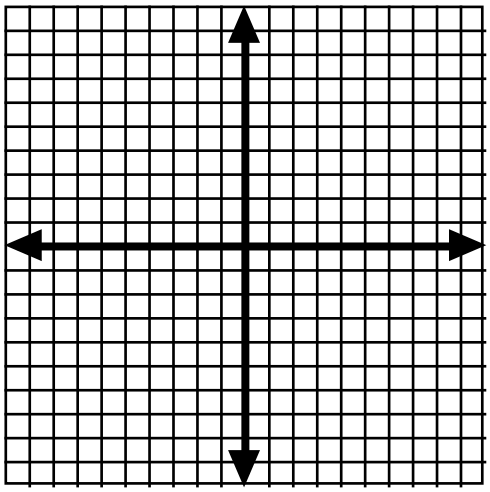
   a. A(-2, 2), B(5, 2) _____ b. M(4, 2), N(4, 10) _____

   c. X(1, 4), Y(1, -7) _____ d. R(-9, 5), S(8, 5) _____

Graph for question 1



Graph for question 2



2. **Plot** and **join** each pair of points on the above right coordinate plane .

   a. C(0, 6), D(6, 0) b. T(-3, 0), U(0, 3) c. G(-3, -3), H(4, 4)

LG 8 Assignment #2 (Graphing Using Tables)

Equations with two variables such as x + y = 7 are called **linear** since their graphs are always straight lines. In order to graph linear equations on a Coordinate Plane, ordered pairs must be found which make the equation true.

- Draw the table.
- Choose x-values (start with 0, if it works evenly then go up by the coefficient. of y).
- Solve for y and fill in coordinates (x,y).
- Plot the coordinate points.
- Draw and label the resulting line.

Example:

x	**2x + 3y = 6**	y	(x,y)
0	0 + 3y = 6	2	(0,2)
3	6 + 3y = 6	0	(3,0)
6		-2	(6,-2)
9		-4	(9,-4)

Create a table of values with at least **3 ordered pairs** for each of the following equations then **graph** the equations. Check your graphs against the answers at the end of this package. Note that you may plat **different** points than in the answer key but you must get the **same line** as the answer key.

1. $y = x + 3$

2. $y = 2x$

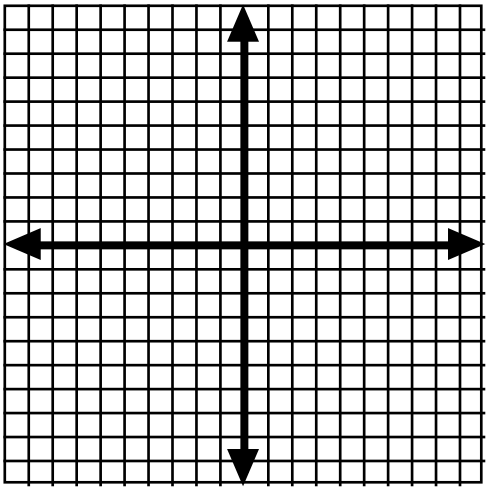
3. $y = 2x - 3$

4. $2x + y = 6$

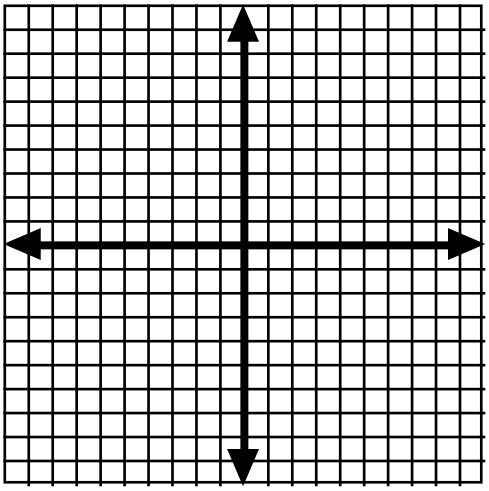
5. $4x - 3y = 12$

6. $x - 3y = 9$

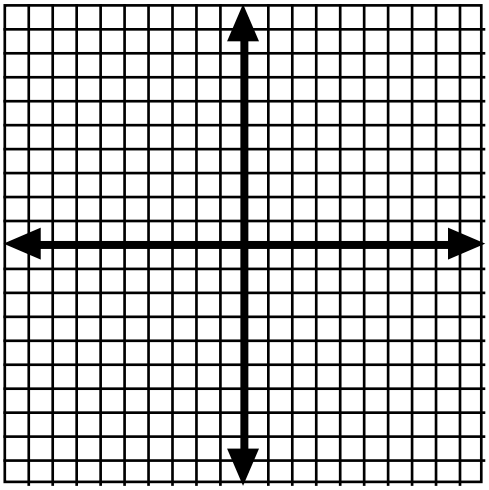
Graph for question 1



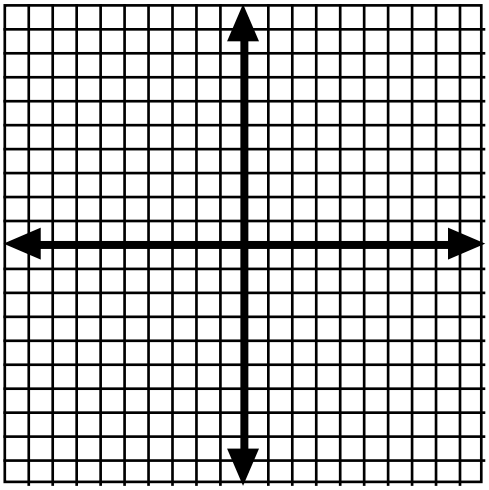
Graph for question 2



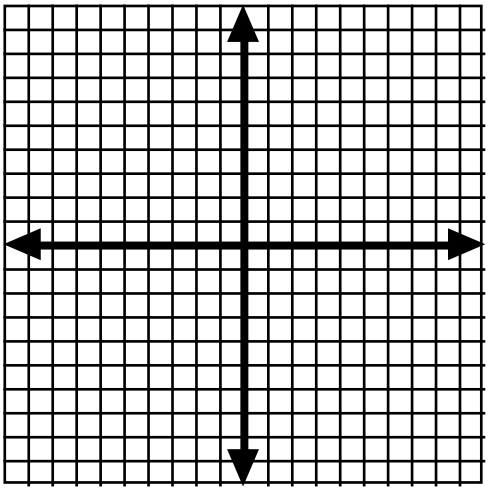
Graph for question 3



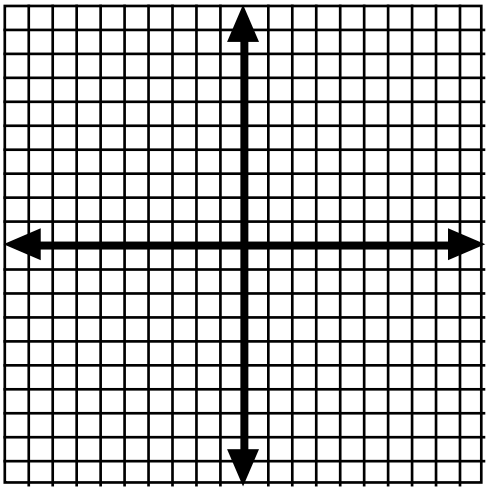
Graph for question 4



Graph for question 5



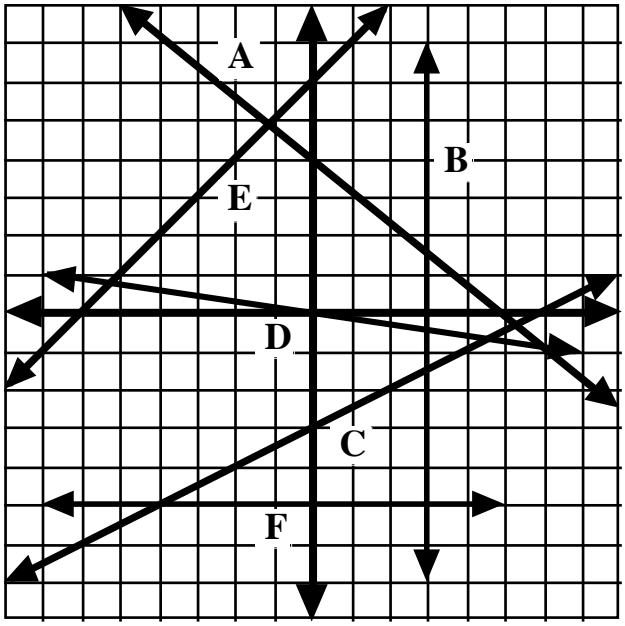
Graph for question 6



LG 8 Assignment #3 (Graphing Using Intercepts)

The point where a graph intersects the x-axis is called the **x-intercept**. Similarly the point where a graph intersects the y-axis is called the **y-intercept**.

1. **Find** the **x** and **y intercepts** for each line graphed below:



	A	B	C	D	E	F
x-intercept	**(, 0)**					
y-intercept	**(0,)**					

You can also use your **algebraic skills** to find intercepts from an equation by **substituting** y = 0 when finding the x-intercept and x = 0 when finding the y-intercept. The reason for this is that the value of any y for a point on the x-axis is 0 and similarly the value of any x for a point on the y-axis is 0.

- Draw table.
- Choose x = 0 and solve for y (y-intercept).
- Choose y = 0 and solve for x (y-intercept).

Example:

x	**2x + 3y = 6**	y	(x,y)
0	0 + 3y = 6	2	(0,2)
3	2x + 0 = 6	**0**	(3,0)

2. **Without graphing** find the x and y intercepts for each of the following lines:

a. $3x + 4y = 12$

b. $x + y = 9$

c. $y = 3x - 6$

d. $\frac{1}{2}x + y = -6$

You can graph a line if you are given its x and y intercepts. **Plot each intercept** where it crosses its axis then connect these two points.

3. **Graph** each of the following:

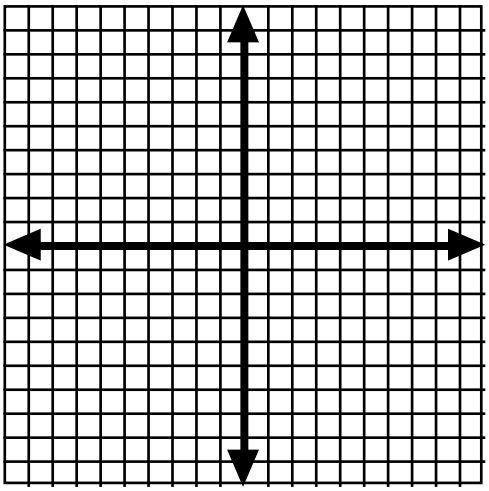
a. A line whose x-intercept is 6 and whose y-intercept is -4.

b. A line whose x-intercept and y-intercepts are 5.

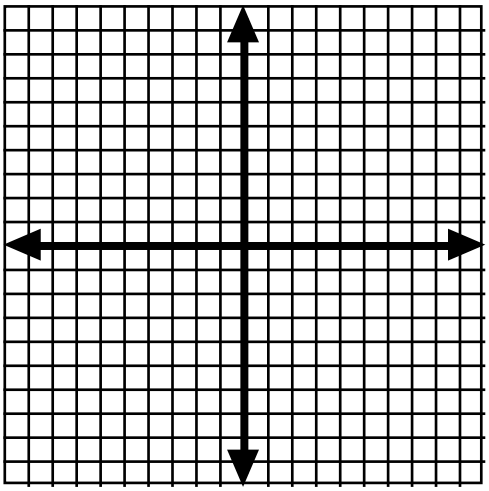
c. A line whose x-intercept and y-intercepts are 0.

d. A line whose x-intercept is 3 but has no y-intercept.

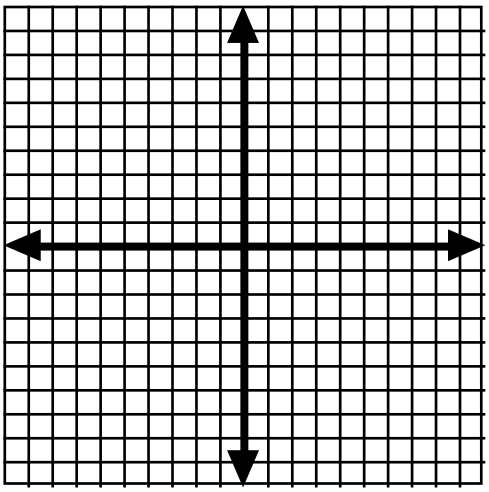
Graph for question 3a



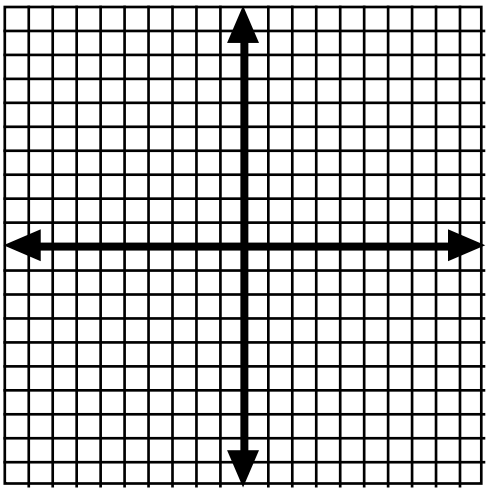
Graph for question 3b



Graph for question 3c



Graph for question 3d



4. **Graph** each of the following using **intercepts only**:

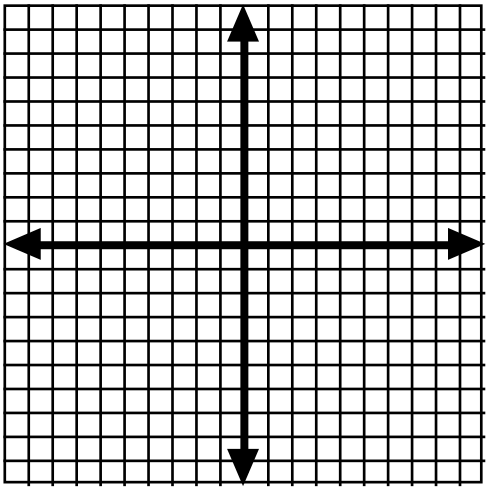
a. $x + 2y = 8$

b. $2x - 3y = 12$

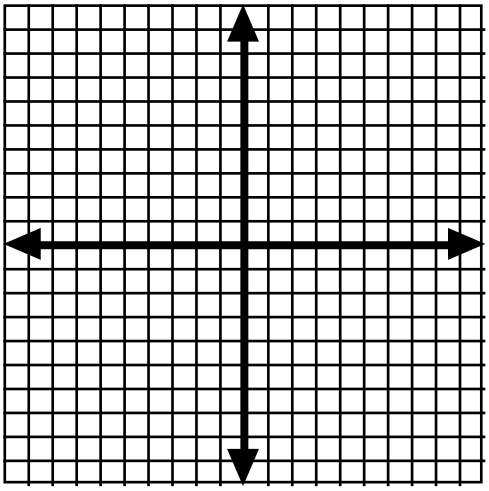
c. $y = 3x - 6$

d. $\frac{1}{2}x + \frac{1}{3}y = 2$

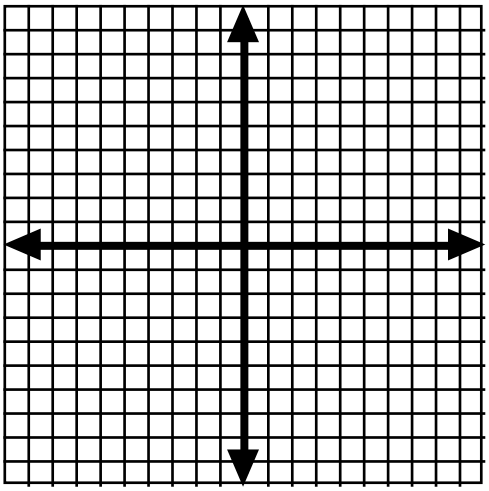
Graph for question 4a



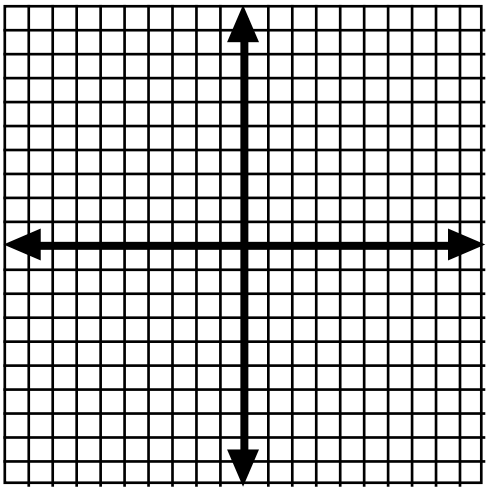
Graph for question 4b



Graph for question 4c



Graph for question 4d



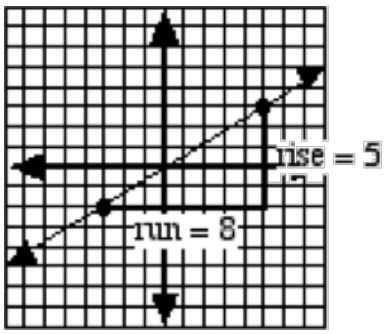
LG 8 Assignment #4 (Finding Slope Given a Graph or Points)

The **slope** of a line is the **measurement of its steepness**. The steeper the line, greater the magnitude of its slope. To calculate the slope of a line, choose any 2 points on the line and determine how many units the line rises between those points and divide it by the number of units it runs along those same points (A fall is shown by a negative number). The steepness (slope) of every **horizontal** line is **0**. The slope of a **vertical** line is **not defined** or you can say that vertical lines have no slope.

One of the ways to find slope is to count the squares when given the graph of the line.

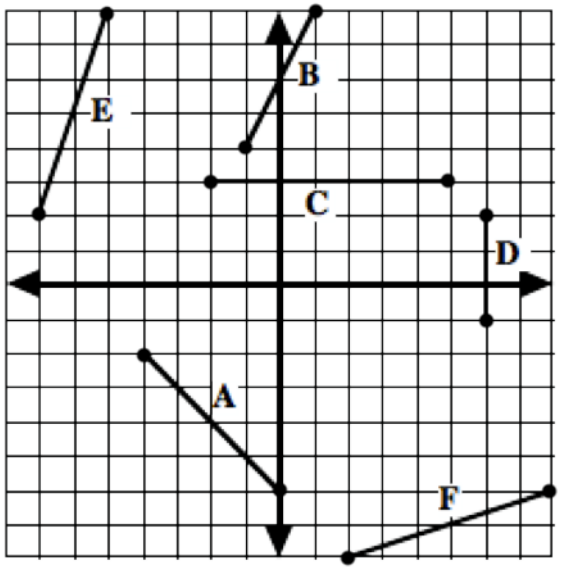
- Decide on the type of slope (+, –, 0, No slope).
- Choose 2 pts. on the line and create a right triangle by drawing a horizontal and vertical line from the chosen point.
- Calculate the vertical and horizontal components.
- State slope in fractional form using **m=** $\frac{\textbf{rise}}{\textbf{run}}$.

Example:



$m = \frac{rise}{run} = \frac{5}{8}$

1. **Find the slope** of each of the lines graphed below:



	A	B	C	D	E	F
slope	$\frac{\text{rise}}{\text{run}} = \frac{}{}$					

Sometimes you may know ordered pairs through which the line passes and you need to find the slope without graphing. If you have two different ordered pairs joined together to make a line then the slope of that line can be found by using the slope formula: $\mathbf{m = \frac{y_2 - y_1}{x_2 - x_1}}$

One of the ways to find slope is to find 2 points on the graph of the line and use the slope formula.

- Write down the formula.
- Substitute into the formula. $\mathbf{m = \frac{y_2 - y_1}{x_2 - x_1}}$
- Simplify the expression to determine the slope.

Example:

given (-2,3) & (4.7)

$$\mathbf{m = \frac{y_2 - y_1}{x_2 - x_1}} = \frac{7-3}{4-{}^{-}2} = \frac{4}{6} = \mathbf{\frac{2}{3}}$$

2. **Find the slope** of the line that passes through the given pair of points:

a. (9, 3) and (7, 6)

b. (3, -5) and (5, -6)

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

c. (2, 7) and (4, 3)

d. (3, -4) and (9, 4)

e. (6, 2) and (-2, 2)

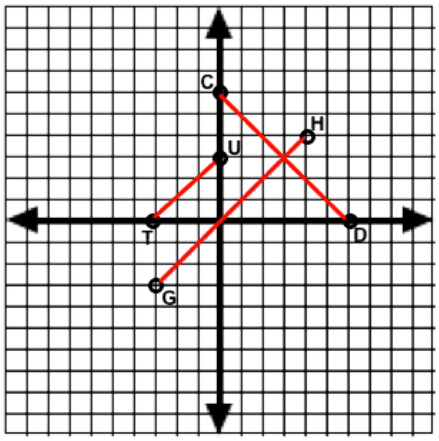
f. (1, 8) and (1, -2)

Answers:

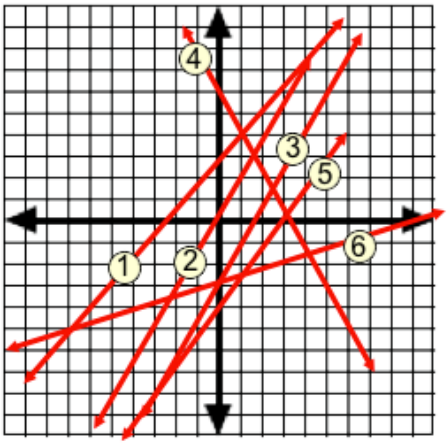
Assignment #1

1a) Pt. A-Quad. 2, Pt. B-Quad. 1 / Horiz.
b) Pt. M-Quad. 1, Pt. N-Quad. 1 / Vert.
c) Pt. X-Quad. 1, Pt. Y-Quad. 4 / Vert.
d) Pt. R-Quad. 4, Pt. S-Quad. 1 / Horiz.

2.



Assignment #2 - Question #1 Graphs



Assignment #2 ***** See above right for graphs ***** ↑ ↑

1.

x	*y = x + 3*	*y*	*(x, y)*
0	0 + 3	3	(0, 3)
1	1 + 3	4	(1, 4)
2	2 + 3	5	(2, 5)

2.

x	*y = 2x*	*y*	*(x, y)*
0	2(0)	0	(0, 0)
1	2(1)	2	(1, 2)
2	2(2)	4	(2, 4)

3.

x	*y = 2x - 3*	*y*	*(x, y)*
0	2(0) - 3	-3	(0, -3)
1	2(1) - 3	-1	(1, -1)
2	2(2) - 3	1	(2, 1)

4. ***Rearrange to y =***

x	*y = -2x + 6*	*y*	*(x, y)*
0	-2(0) + 6	0	(0, 6)
1	-2(1) + 6	2	(1, 4)
2	-2(2) + 6	4	(2, 2)

5.

x	*4x – 3y = 12*	*y*	*(x, y)*
0	4(0) – 3y = 12	-4	(0, -4)
3	4(1) – 3y = 12	0	(3, 0)
-3	4(2) – 3y = 12	-8	(-3, -8)

6.

x	*x – 3y = 9*	*y*	*(x, y)*
0	(0) – 3y = 9	-3	(0, -3)
3	(3) – 3y = 9	-2	(3, -2)
-3	(-3) – 3y = 9	-4	(-3, -4)

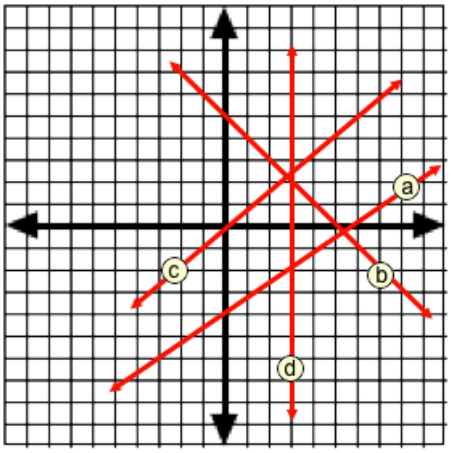
Assignment #3

1.

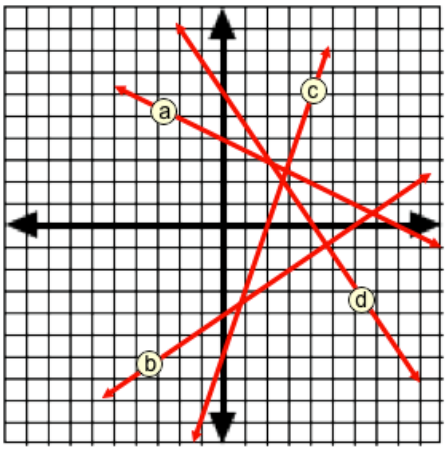
	A	B	C	D	E	F
x-int	(5, 0)	(3, 0)	(6, 0)	(0, 0)	(-6, 0)	**none**
y-int	(0, 4)	**none**	(0, -3)	(0, 0)	(0, 6)	(0, -5)

2. a. (4, 0) ; (0, 3) b. (9, 0) ; (0, 9) c. (2, 0) ; (0, -6) d. (-12, 0) ; (0, -6)

3.



Question #4 Graphs



4. ***** See above right for graphs ***** ↑ ↑

a.

x	*x + 2y = 8*	*y*	*(x, y)*
0	0 + 2y = 8	4	(0, 4)
8	x + 2(0) = 8	0	(8, 0)

b.

x	*2x – 3y = 12*	*y*	*(x, y)*
0	2(0) – 3y = 12	-4	(0, -4)
6	2x – 3(0) = 12	0	(6, 0)

c.

x	*y = 3x - 6*	*y*	*(x, y)*
0	y = 3(0) - 6	-6	(0, -6)
2	0 = 3x - 6	0	(2, 0)

d.

x	*1/2x + 1/3y = 2*	*y*	*(x, y)*
0	1/2(0) + 1/3y = 2	6	(0, 6)
4	1/2x – 1/3(0) = 2	0	(4, 0)

Assignment #4

1.

	A	B	C	D	E	F
slope	$\frac{\text{rise}}{\text{run}} = \frac{4}{4} = -1$	$\frac{4}{2} = 2$	$\frac{0}{7} = 0$	$\frac{3}{0}$ no slope	$\frac{6}{2} = 3$	$\frac{2}{6} = \frac{1}{3}$

2. *a.* $m = \frac{3}{5}$ *b.* $m = \frac{-1}{2}$ *c.* $m = -2$ *d.* $m = \frac{4}{3}$ *e.* $m = 0$ *f.* $m = no\ slope$