

Slope

Summary

Students will learn definition of slope. Given a line students will identify the slope. Students will draw a line given a point and a slope. Hopefully slope will be computed given to points.

Teacher

Transparency 1,2 and 3

Student

Worksheets 1-3

Description of Lesson

Lead a discussion about handicap ramps, roofs and gradients as a lead in to slope

Use transparency 1 to define slope. Distribute worksheet 1 for students

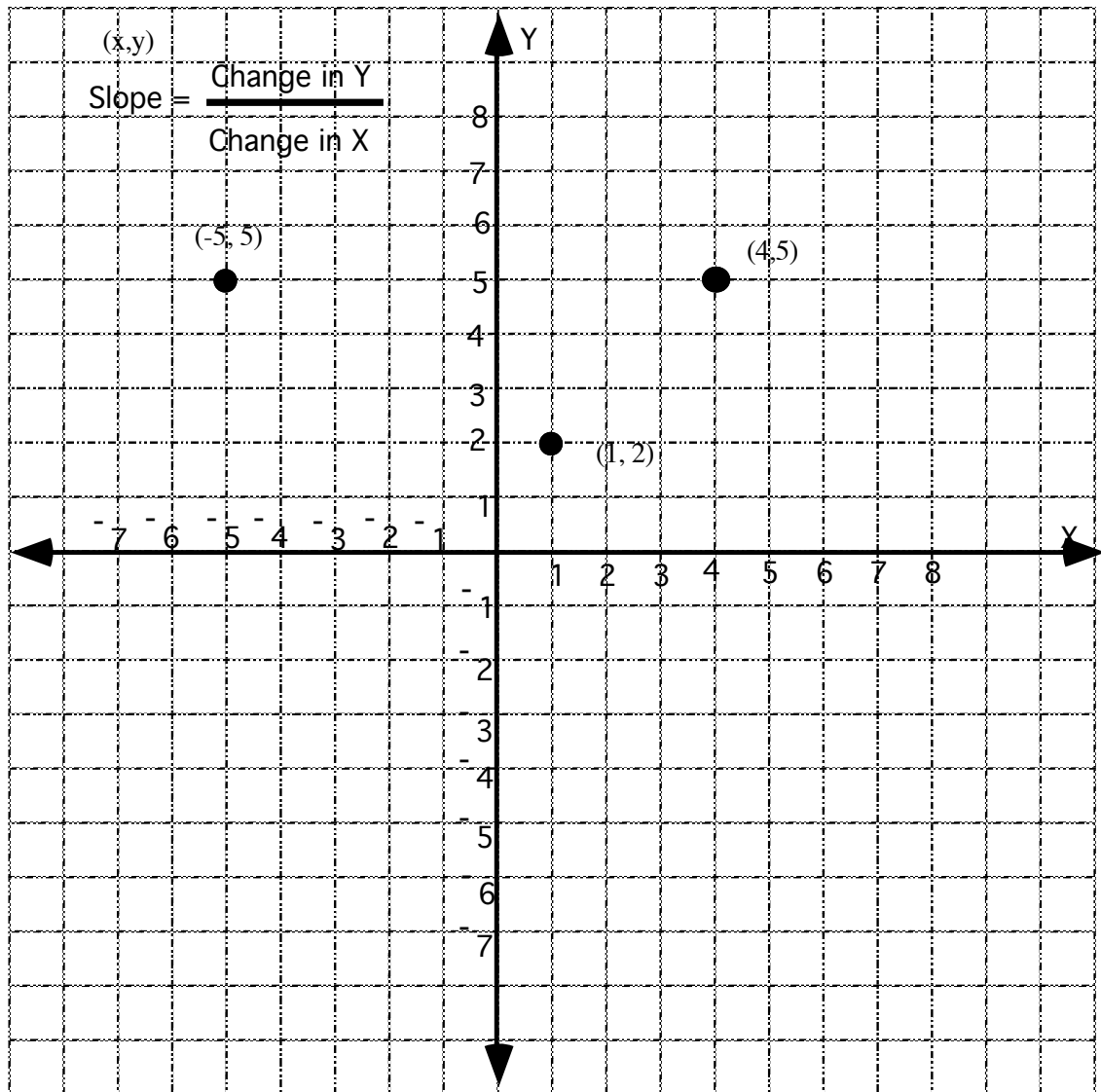
Use Transparency 2 to demonstrate the various ways of computing slope from a graph. Distribute worksheet 2.

Use transparency 3 to identify slopes. Discuss how to handle "hidden points"
Distribute Worksheet 3

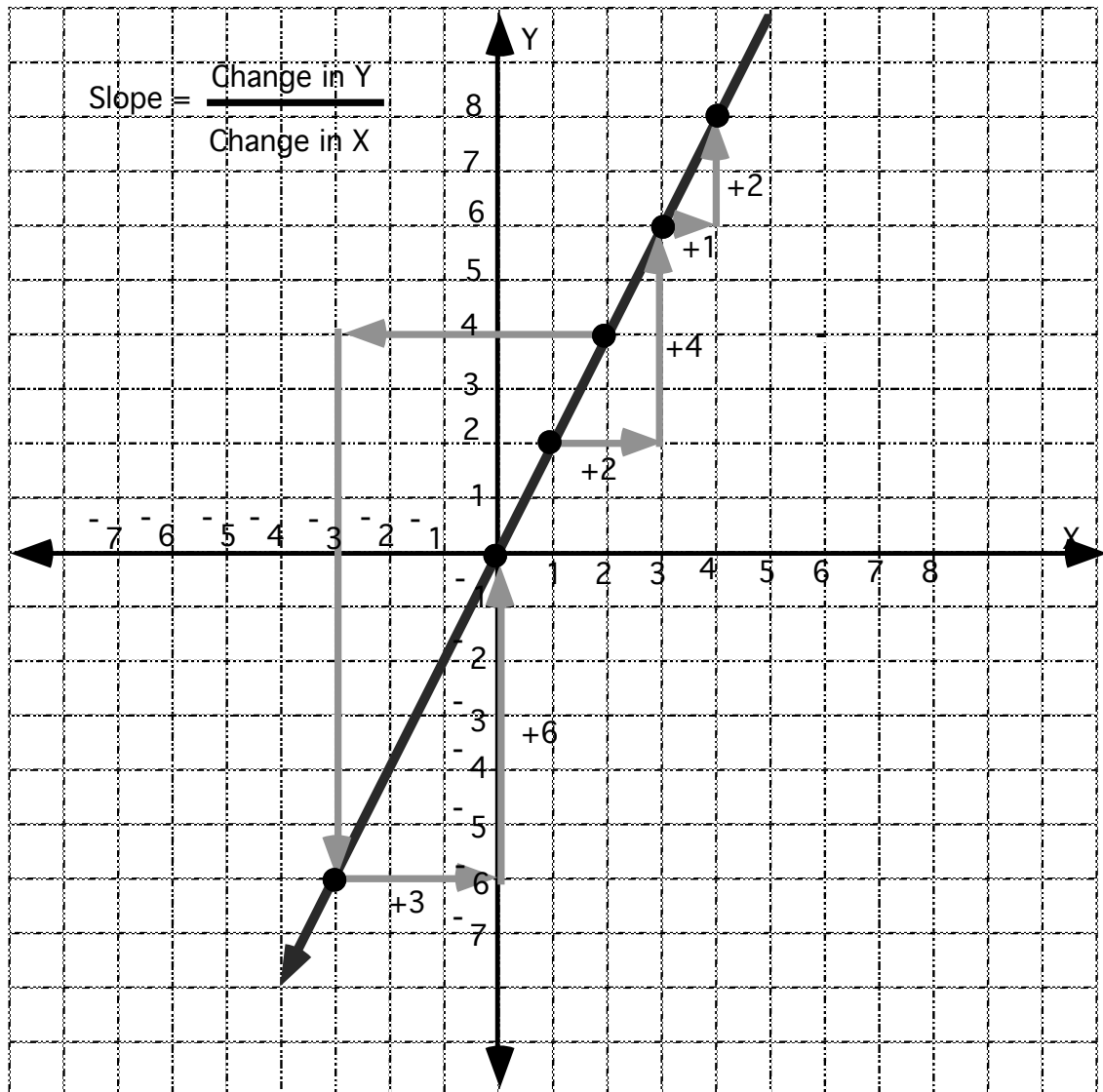
Use transparency 4 to introduce special lines

Distribute worksheet 4.

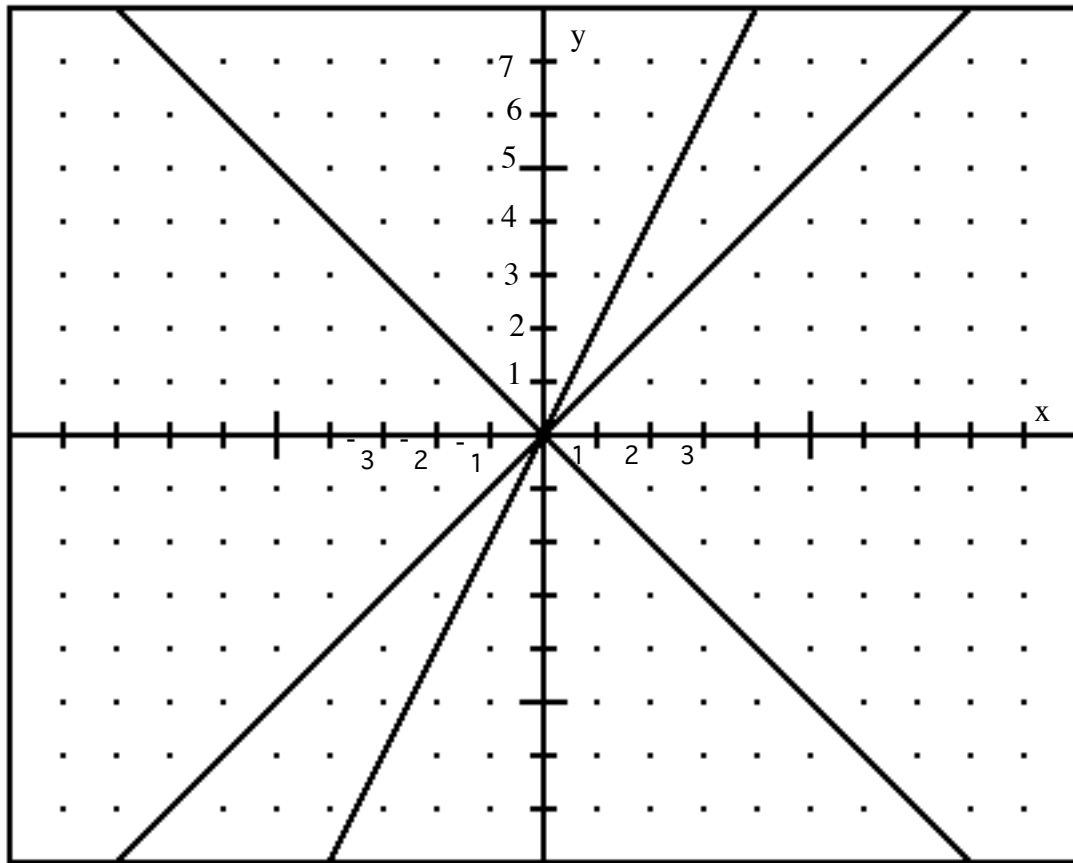
T1.



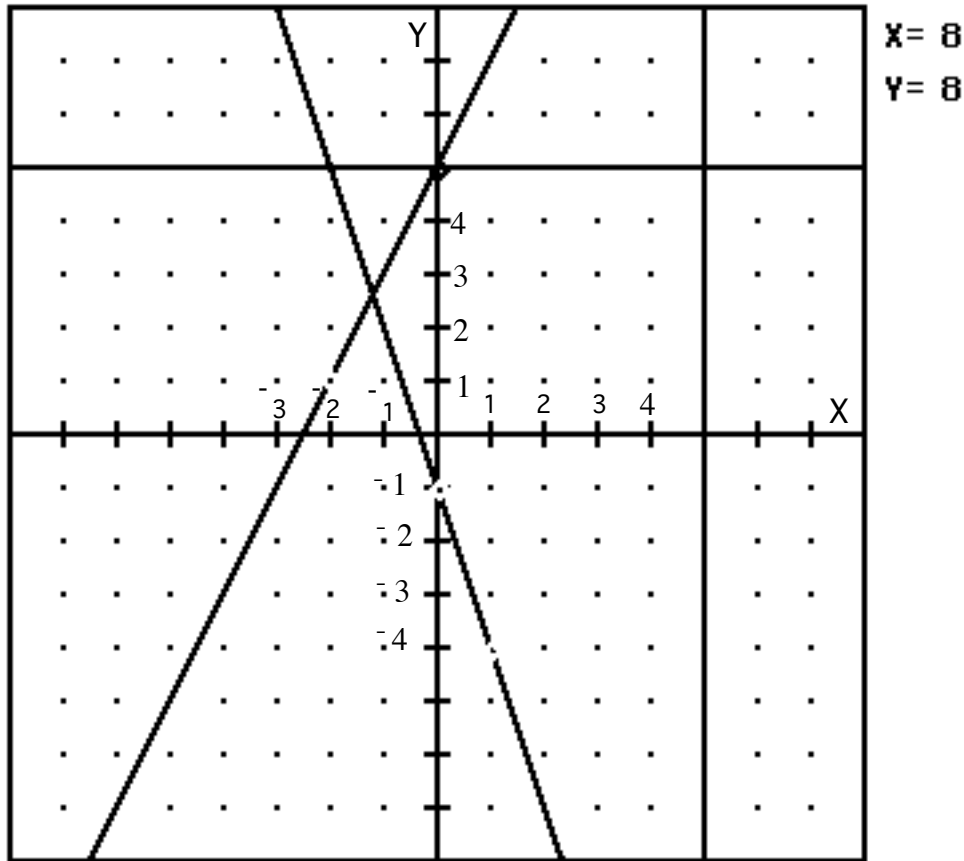
T2.



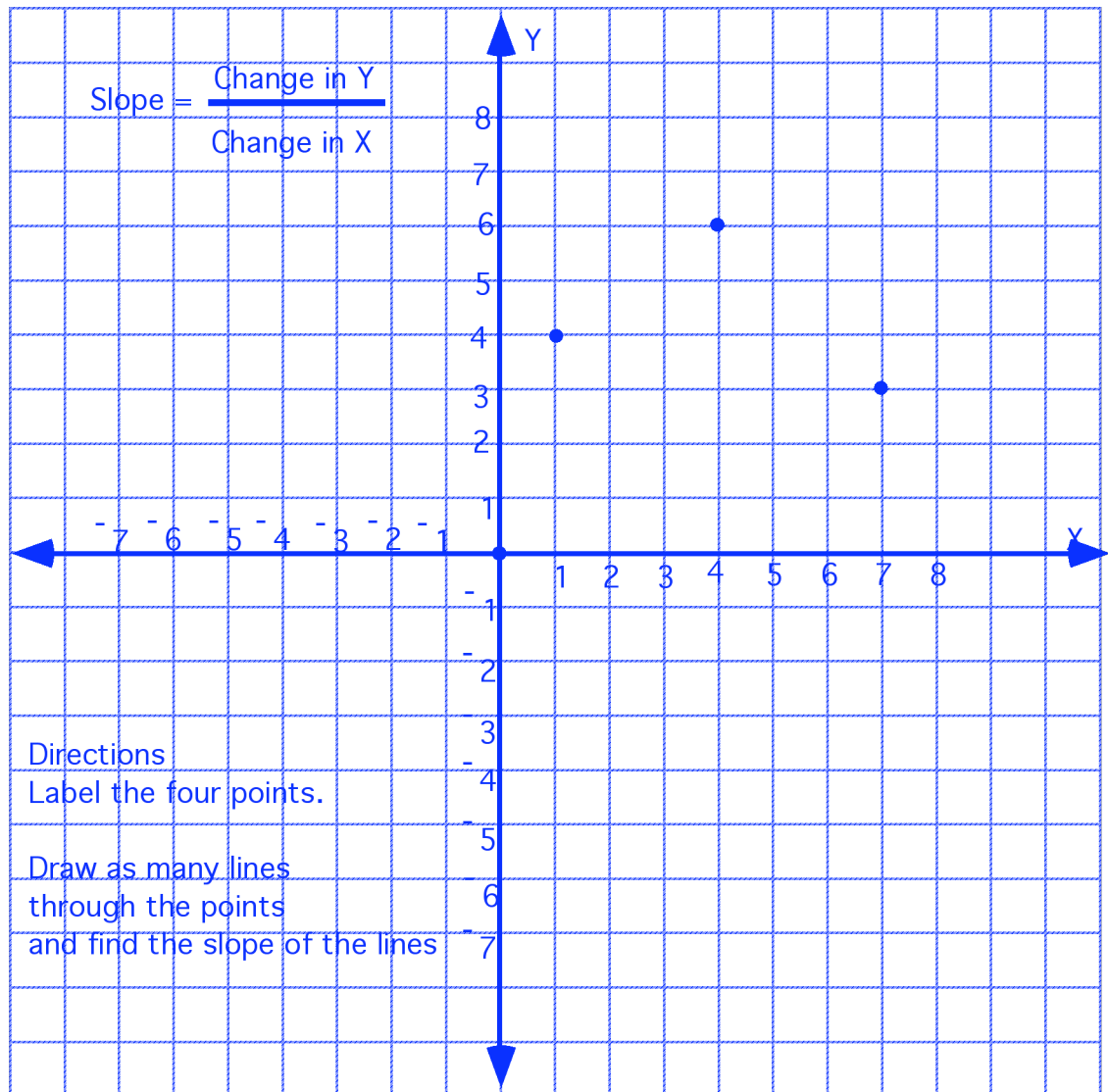
T3.



T4

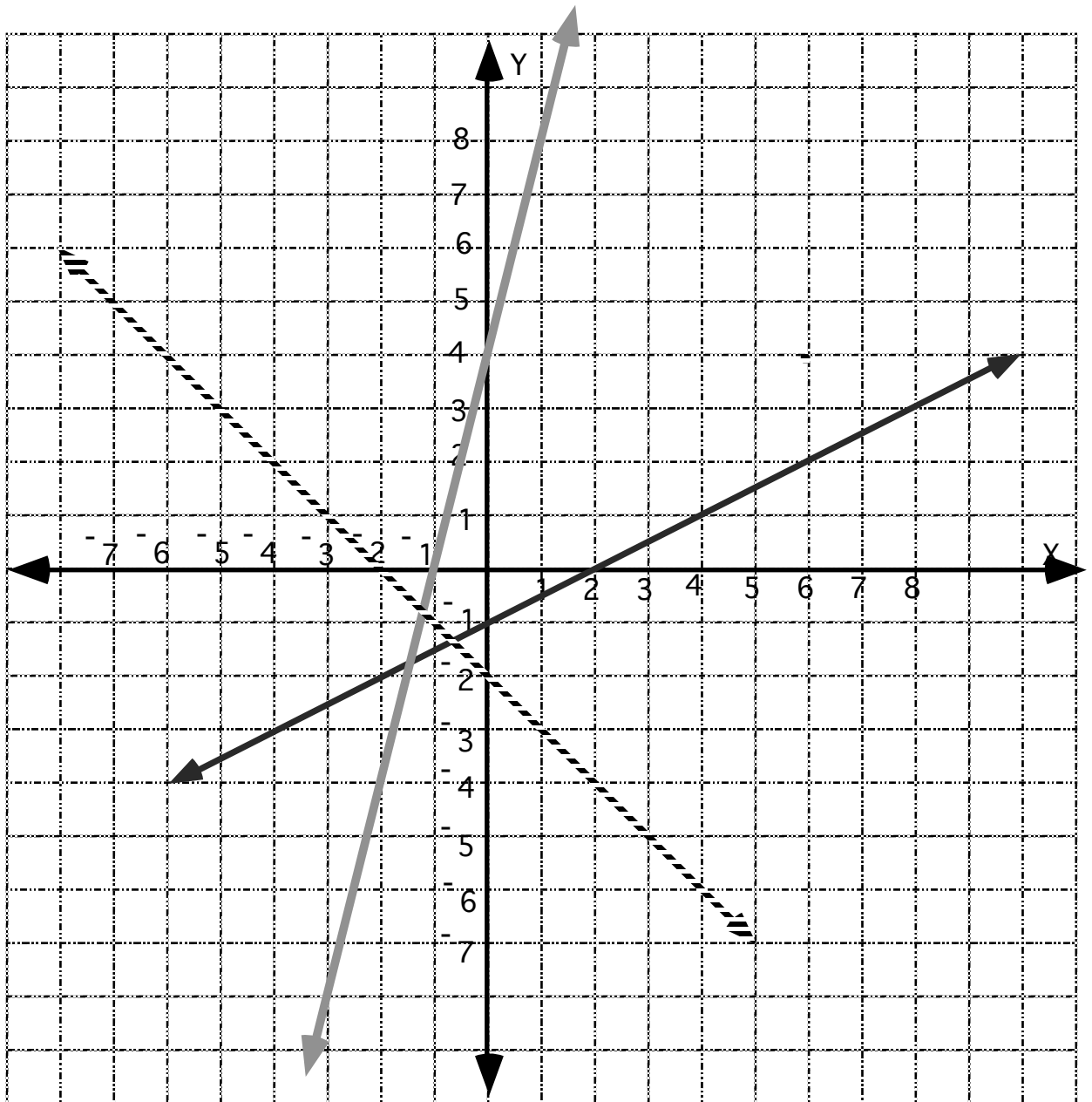


Worksheet 1



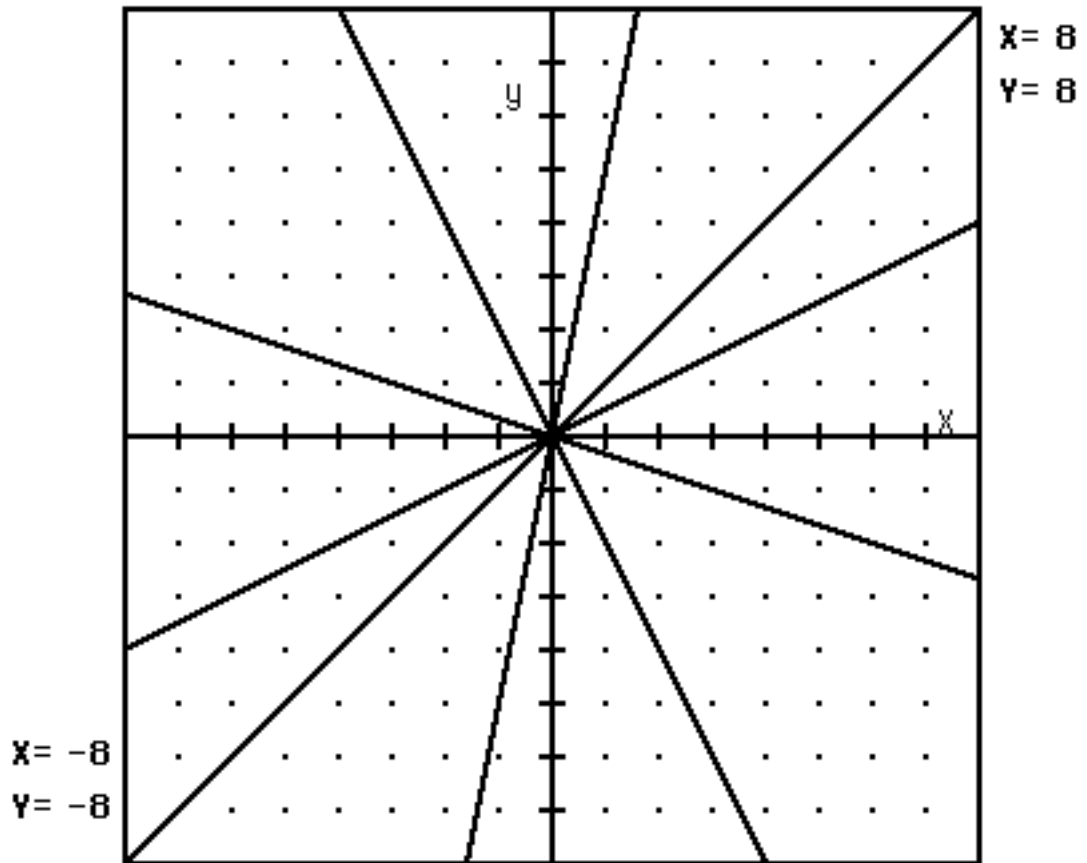
Worksheet 2

Find the slope of the lines below.



Worksheet 3

Find the slope of the lines below:

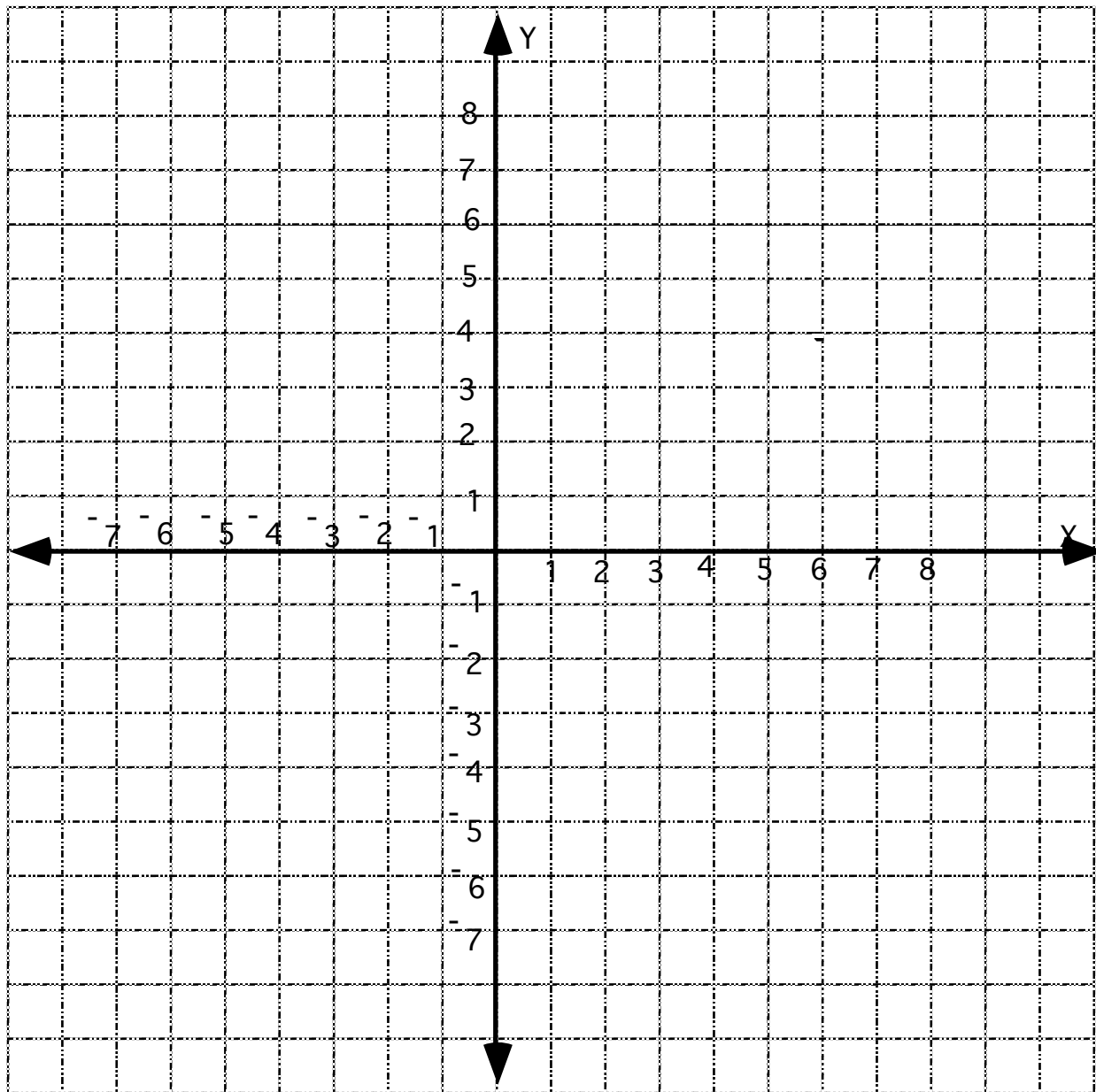


Worksheet 4

Plot the point $(2,3)$ on the graph and draw a line through $(2,3)$ with a slope of 2.

Plot the point $(-2, 0)$ on the graph and draw a line through $(-2,0)$ with a slope of -1

Plot the point $(-2,3)$ on the graph and draw a line through $(-2,3)$ with a slope of $\frac{3}{4}$



Day 2

In the Computer Lab

Introduce how to use Green Globes and Let the students in pairs work on the following worksheet. Circulate and ask students questions to get them to reflect on the data.

Directions for Green GlobsTo graph equations type the equation and hit return

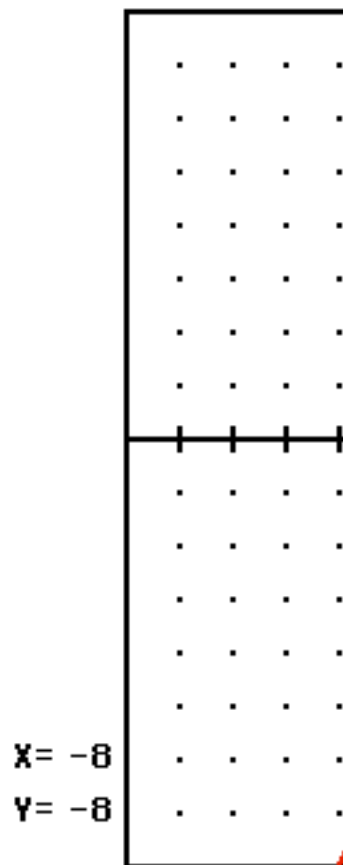
» $Y = 2 X$

To graph a new equation click on Erase Equation

and then type a new equation.

To erase a graph, Click on the equation of the graph in the upper left hand corner and hit the DELETE key.

$$Y = 2X$$




» $Y = 2 X$

Graph the equation $y = 5x$. Locate two points on the graph and find the change in Y and the change in X. Fill in the chart below

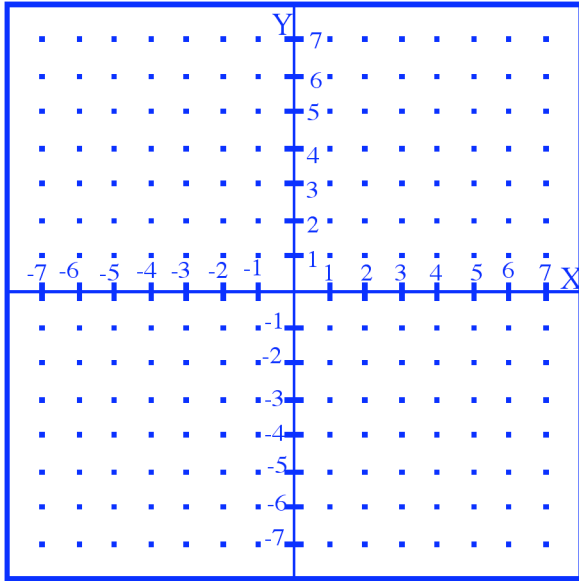
Equation	Change in Y	Change in X	Slope $\frac{\Delta y}{\Delta x}$

Erase the graph by clicking on $y = 5x$ at the left of the screen and hit delete

Graph the following functions one at a time, copy it to the graph paper below, then fill

in the chart. Don't forget to click on  to erase the equation each time before you type. You can just hit return instead.

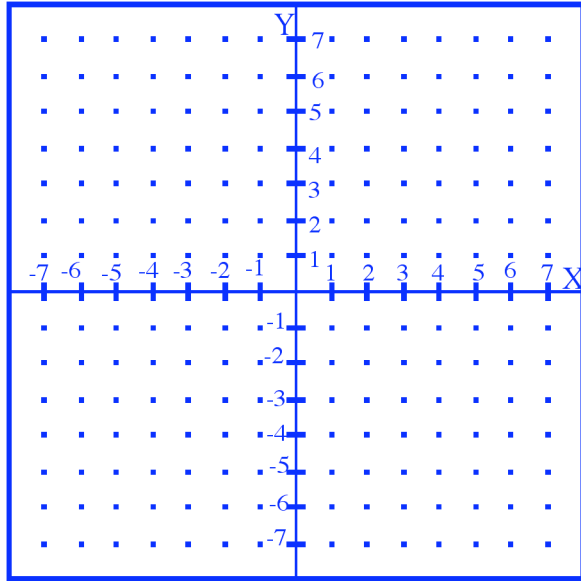
Equation	Change in Y	Change in X	Slope
$y = x$			
$y = 2x$			
$y = 3x$			
$y = (1/2)x$			
$y = 5x$			



Erase the graphs by clicking on the equations on the left of the screen and hit the **delete** key.

Graph the following equations. Copy them on the graph and determine the slopes of the lines.

Equation	Change in Y	Change in X	Slope
$y = -x$			
$y = -2x$			
$y = -3x$			
$y = -(1/2)x$			
$y = -5x$			



Erase your graphs

Graph

$y = (3/5)x$ Slope _____

$y = (-3/5)x$ Slope _____

$y = 4x$ Slope _____

$y = -4x$ Slope _____

Erase your graphs

Predict the slope of the following lines the graph them.

$$y = (2/3)x$$

Slope_____

$$y = 6x$$

Slope _____

$$y = -3x$$

Slope_____

$$y = -1x$$

Slope_____

$$y = (3/4)x$$

Slope_____

When an equation has the form of $y = m \cdot x$ how can you predict the slope of the equation?

Erase your graphs

Graph the following:

$$y = 2x + 5$$

$$y = -3x + 5$$

$$y = 5x + 5$$

$$y = 3x + 5$$

$$y = 5 + x$$

$$y = 5 + 6x$$

What do all of the graphs have in common?

Erase your graphs. and graph the following:

$$y = 3x + -2$$

$$y = -x + -2$$

$$y = (2/3)x + -2$$

$$y = 6x + -2$$

$$y = -2 + 7x$$

$$y = -2 + x$$

What do all of the graphs have in common?

Erase your graphs

Predict the point where these equations will cross the Y axis. (this is called the y-intercept)

$y = 3x$	Slope _____	Y-intercept <u>(0,)</u> _____
$y = 3x + 5$	Slope _____	Y-intercept <u>(0,)</u> _____
$y = 3x + -7$	Slope _____	Y-intercept <u>(0,)</u> _____
$y = 3x + 3$	Slope _____	Y-intercept <u>(0,)</u> _____
$y = 3x - 1$	Slope _____	Y-intercept <u>(0,)</u> _____
$y = 2 + 3x$	Slope _____	Y-intercept <u>(0,)</u> _____
$y = -5 + 3x$	Slope _____	Y-intercept <u>(0,)</u> _____

Graph the equations to see if you are correct.

Erase your graphs

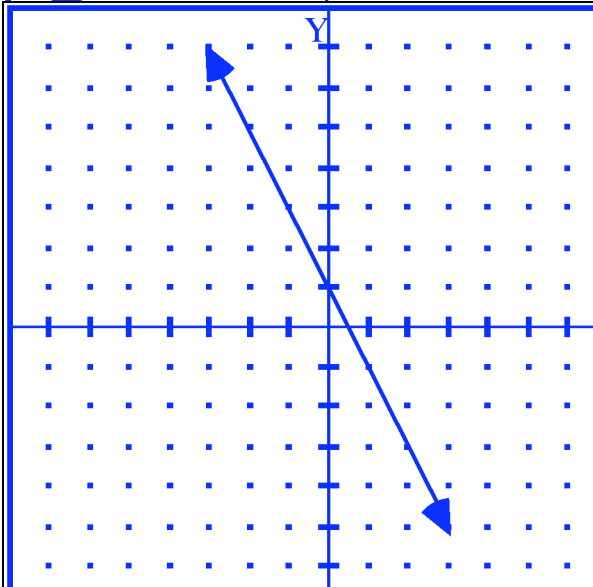
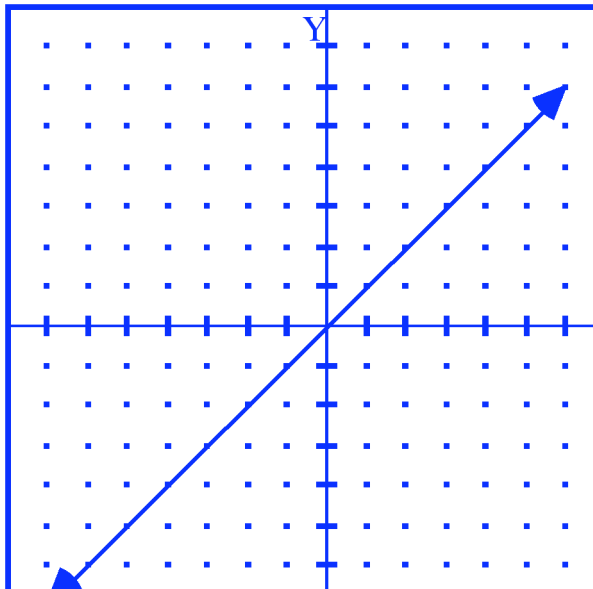
Summarize your results When an equation is of the form $y = m \cdot x + b$

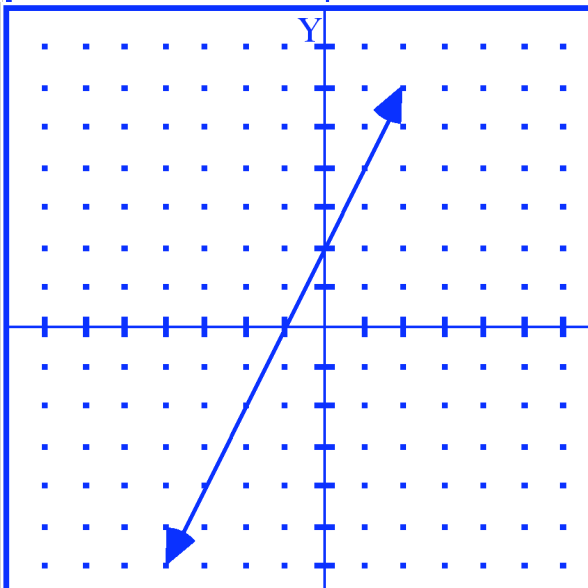
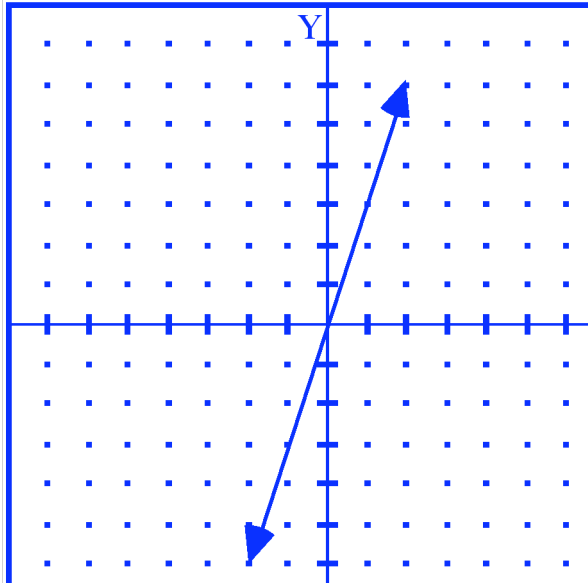
m tells you _____ and b tells you _____

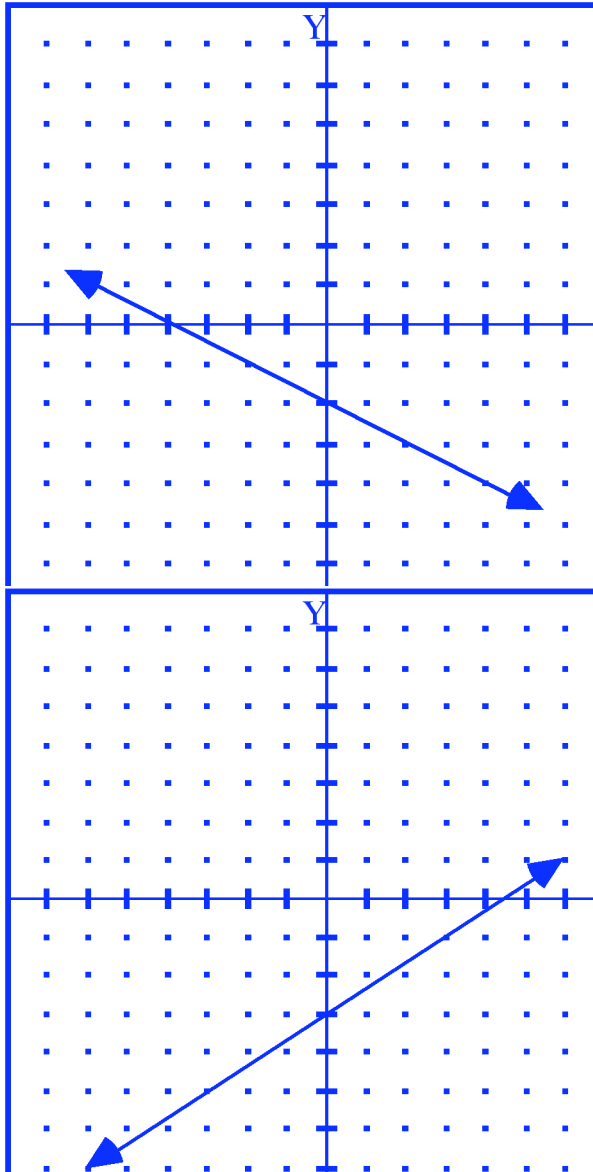
Predict the slope and intercept for the following equations

	Slope	Y-intercept
$y = 2x + 7$		
$y = 3/5 x + 1$		
$y = 4x + 3$		
$y = 6x + 1$		

State the equation of the graphs below:







Special Lines

Graph the following:

$y = 2$

$y = -5$

$y = 0$

$y = 7$

$y = -3$

Predict the following on the graph below:

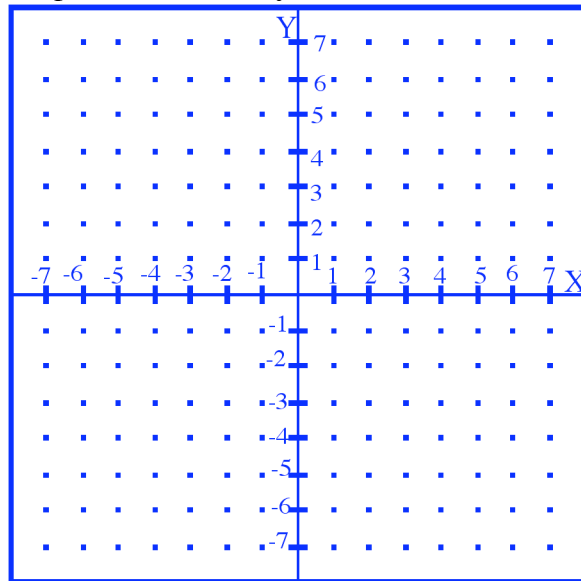
$y = 5$

$y = -4$

$y = 3$

$y = 6$

Graph them to see if you are correct.



List 5 point on the line $y = 3$

Why do you think the line is described as $y = 3$?

Graph the following:

$x = 4$

$x = 6$

$x = -3$

$x = 0$

$x = -4$

Predict the following on the graph below:

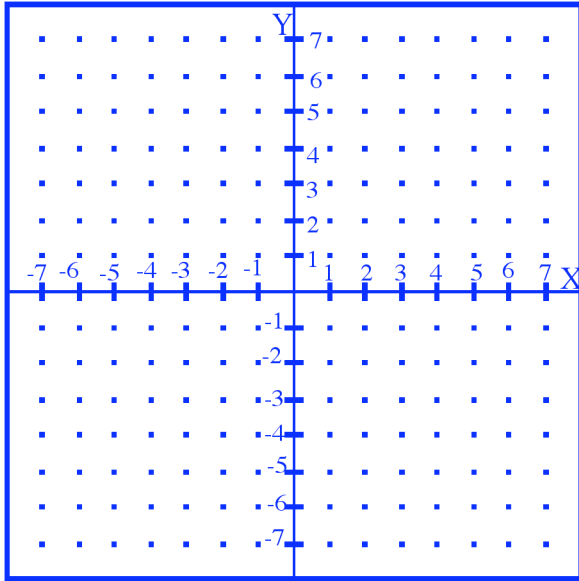
$x = 1$

$x = 4$

$x = -5$

$x = 7$

Graph them to see if you are correct.

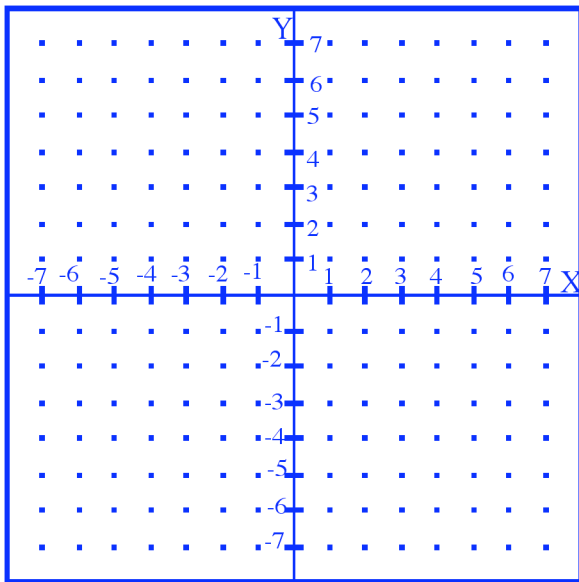


List 5 point on the line $x = 4$

Why do you think the line is described as $x = 4$?

Graph these lines:

$x = 5$ $y = -1$ $x = 2.5$ $y = 4$



$x = -5$ is parallel to the _____ axis.

$y = 8$ is parallel to the _____ axis.

What is the equation of the y - axis?

What is the equation of the x - axis?

What is the slope of these lines? Why?

Day 3

Lead a discussion of the results of the computer Lab. Allow the students to work in groups on the following:

Worksheet $y = m x + b$

To graph an equation of a straight line $y = m x + b$ you need two bits of information.

The slope m and the y-intercept (where it crosses the y axis) $(0, b)$.

To graph $y = \frac{2}{3} x + 1$

Label the X and Y axis.

Change subtraction to addition

Find the slope. _____

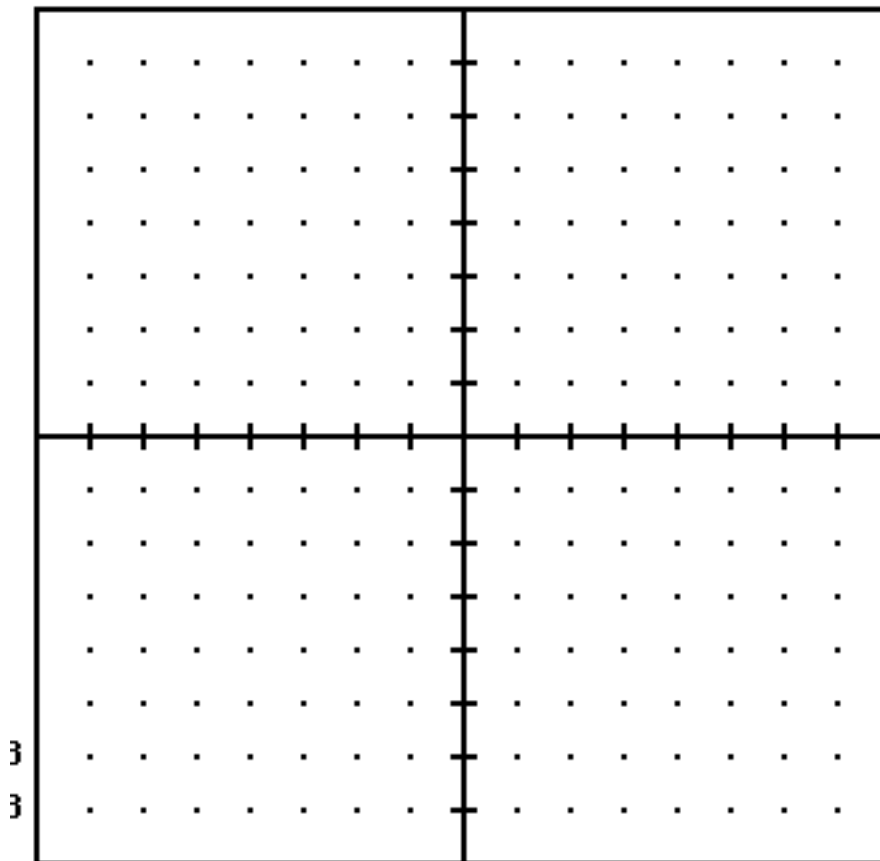
Find the y-intercept _____.

Plot the y - intercept _____

Find at least three more points using the slope. Remember slope is: $\frac{\Delta y}{\Delta x}$.

Label the graph.

(Two points will determine a line but the more points we have the more accurate our graph)



Graph the following on the grid above:

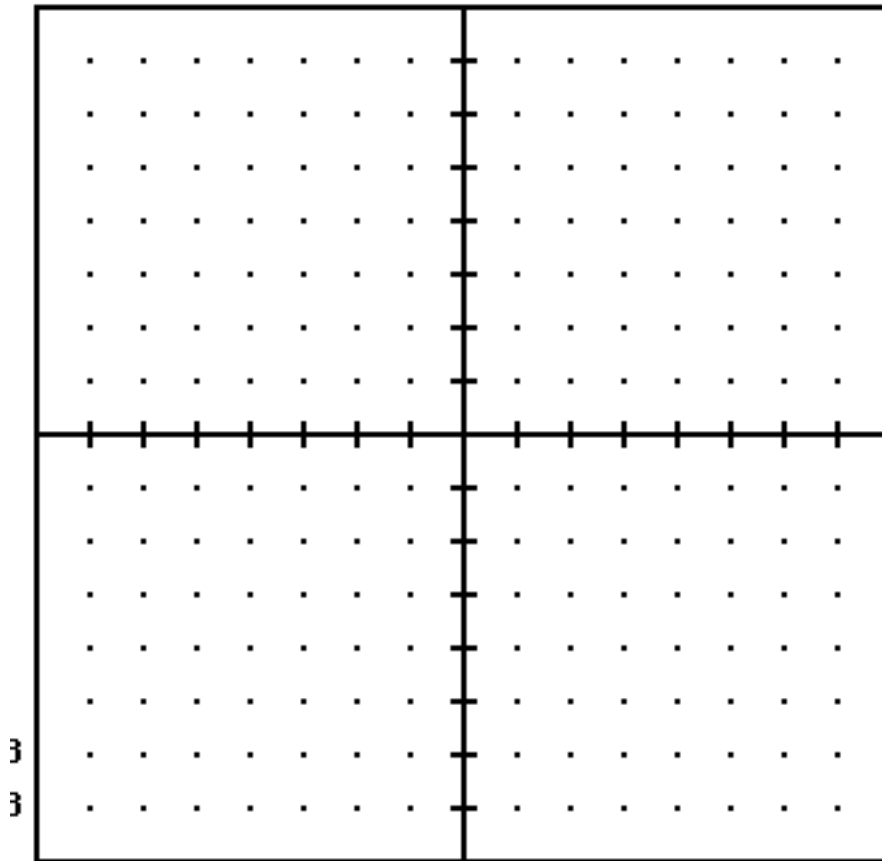
$$y = -2x + -3 \quad m = \underline{\hspace{2cm}} \quad (0, b) =$$

Don't forget to label the graph !!!!!!!

Graph the following on the grid below:

$$y = 3x + 2$$

$$y = \frac{-1}{2} x - 1$$



Graph these below:

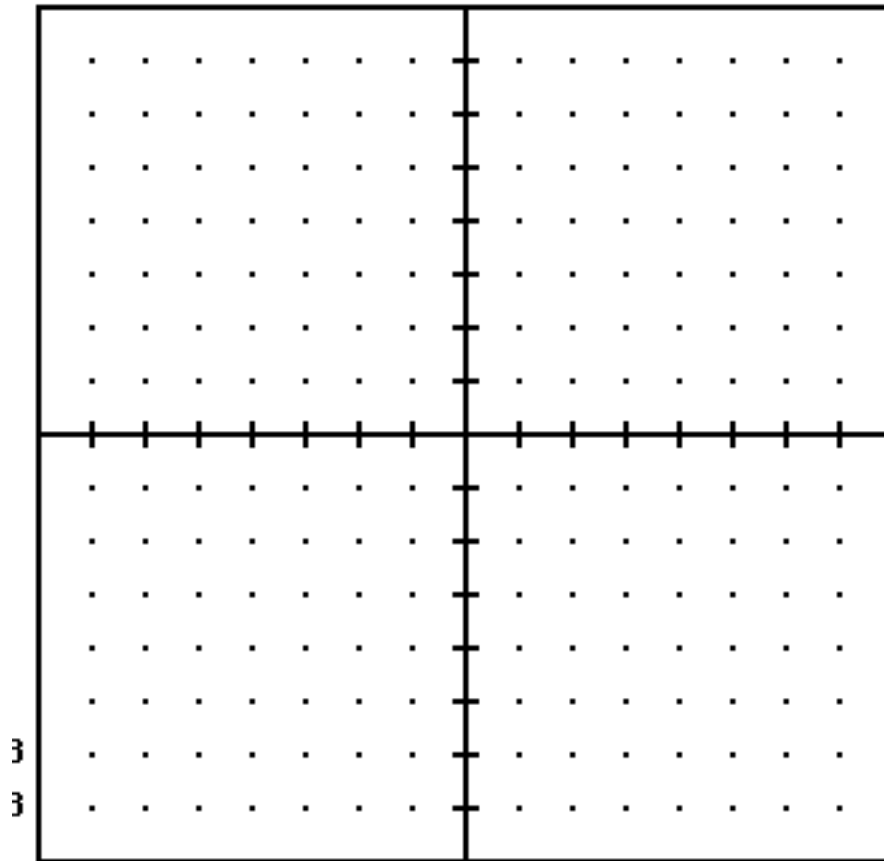
$$y = -1x + 5$$

$$y = \frac{4}{-5}x - 1$$

$$y = 5 - x$$

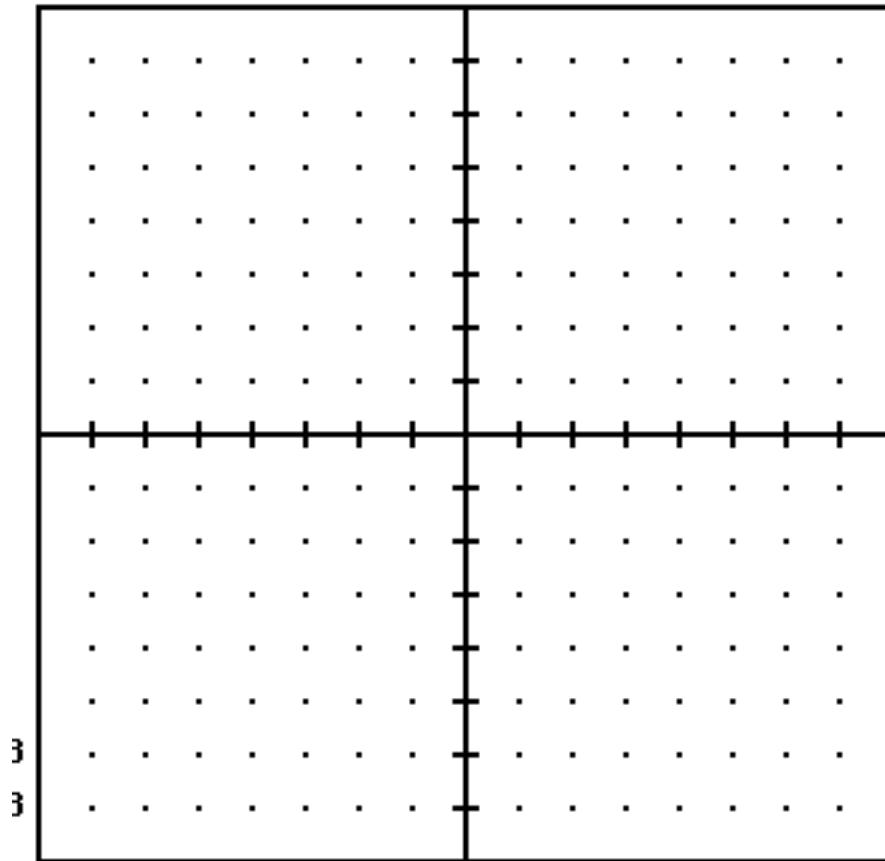
$$y = 5x - 3$$

Did you label the x and y axis?



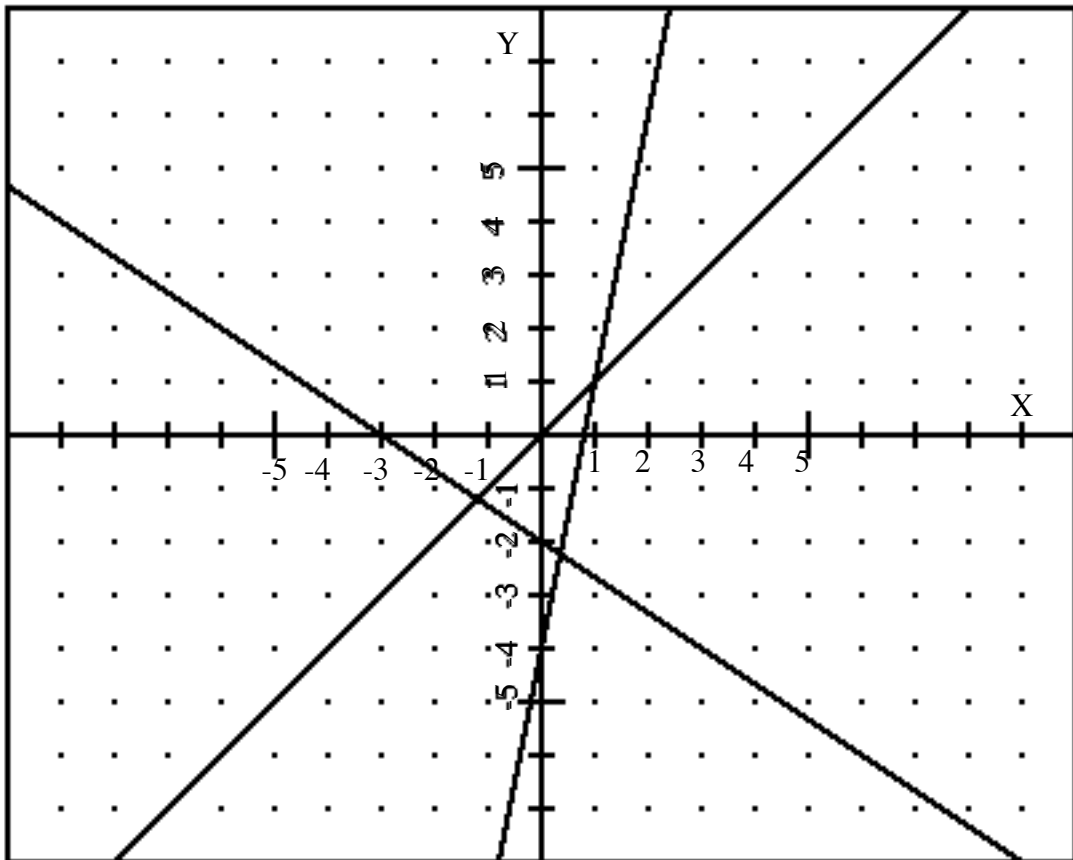
Graph these equations. What do you notice?

$$y = 3x - 5$$
$$y = 3x - 3$$
$$y = 3x$$
$$y = 3x + 2$$



I noticed that _____

Label the graphs below with the equation of the line.



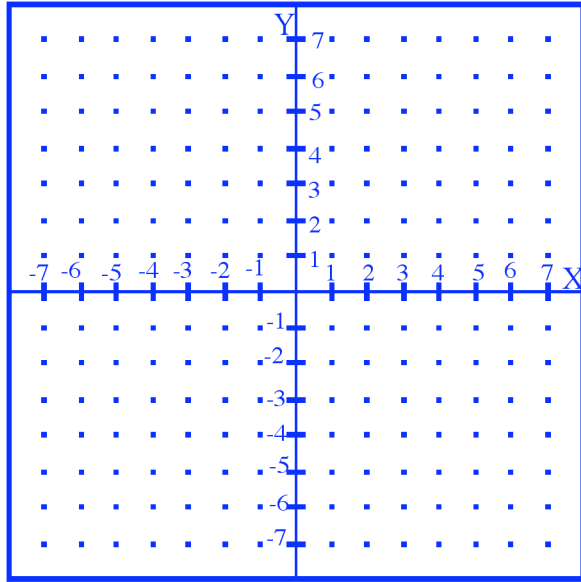
Graph these lines:

$x = 6$

$y = -5$

$x = 3.5$

$y = 4$



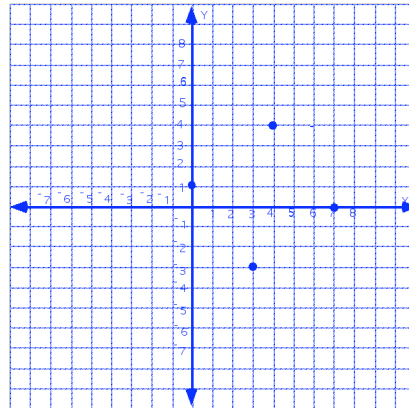
$x = -2$ is parallel to the _____ axis.

$y = 3$ is parallel to the _____ axis.

Review sheet and test for Unit.

Review Sheet Selected answers Name _____

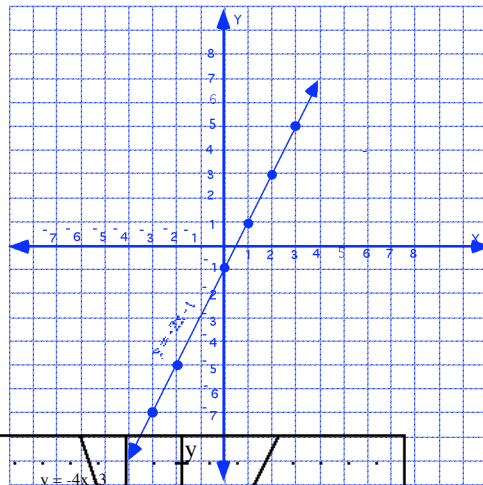
- Plot the points (0,1) (4,4) (7,0) (3, -3) on the graph to the right.



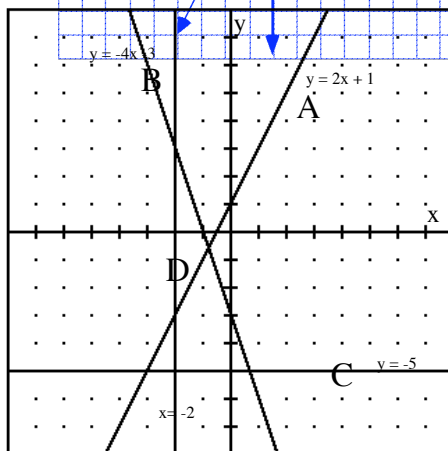
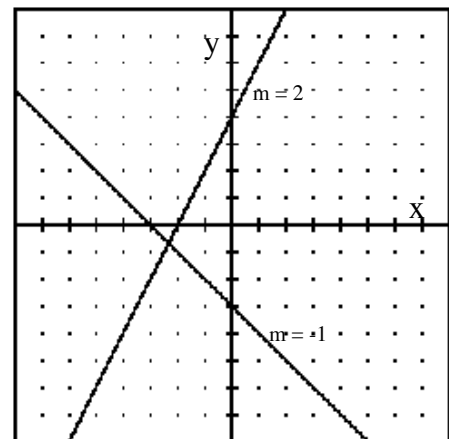
- Evaluate the rule $y = 2x - 1$ for the following values of x.

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

Plot points on the graph below and label the graph.



3.



4.

5. For the points (-2, -3) (4, 5) compute algebraically:

the slope = $\frac{\Delta y}{\Delta x} = \frac{5 - (-3)}{4 - (-2)} = \frac{8}{6} = \frac{4}{3}$ the midpoint = $\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2} = (1, 1)$

6. Name the slope and y-intercept for the following and graph:

$y = \frac{2}{3}x + 5$ $m = \frac{2}{3}$ $b = 5$ y -intercept (0,5)

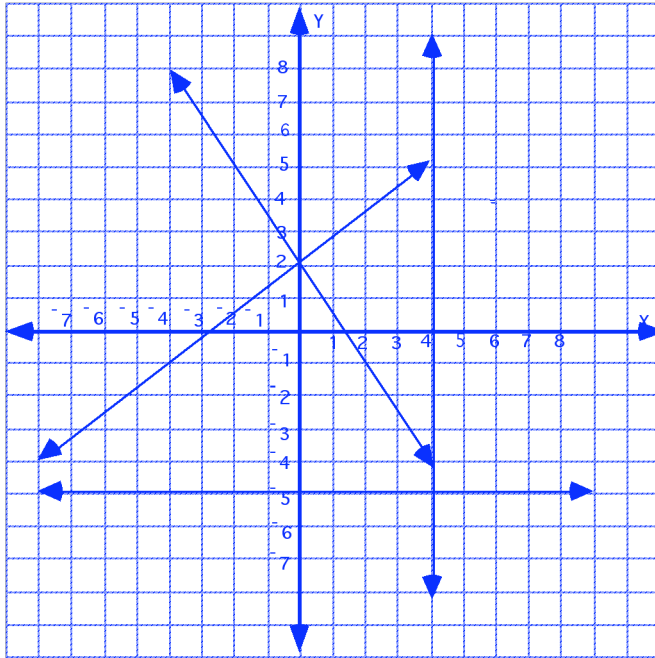
$2x + y = 7$

$m = -2$ $b = -7$ y -intercept (0,7)

$6x - 3y = 9$

$m = 2$ $b = -3$ y -intercept (0, -3)

7. Graph the following: $y = \frac{3}{4}x + 2$ $3x + 2y = 4$ $x = 4$ $y = -2$



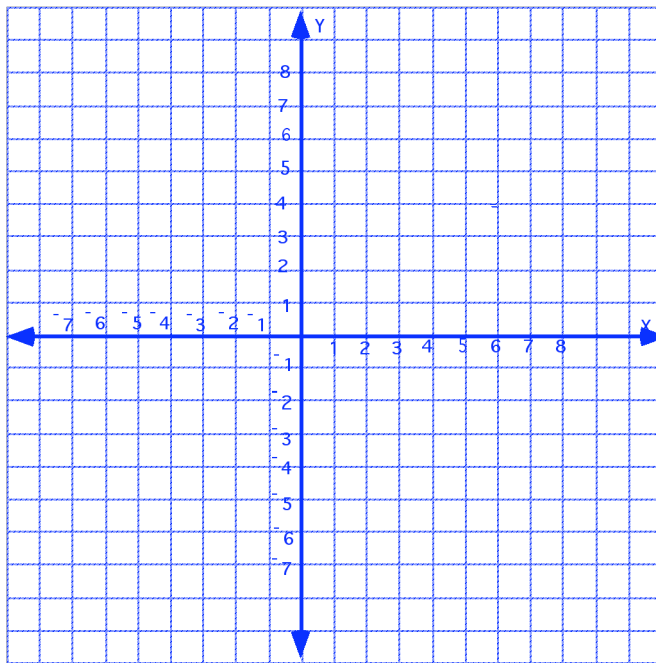
- 8. $y = -x - 1$
- 9. $y = 2x + 5$
- 10. $y = 5x - 7$
- 11. (1,6)
- 12. (4,1)

Name _____
Test 4.

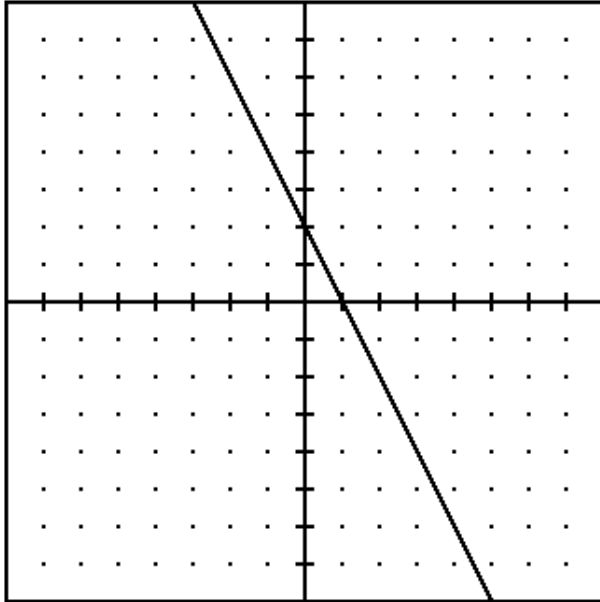
1. Evaluate the rule $y = 3x - 2$ for the following values of x .

x	y
-3	
-2	
0	
1	
2	
3	

2. Plot points on the graph below and label the graph.



3. Find the Slope of the following line.



4. For the points $(-2, -3)$ $(0, 7)$ compute algebraically:

the slope = _____

the midpoint = _____

5. Name the slope and y-intercept for the following and graph:

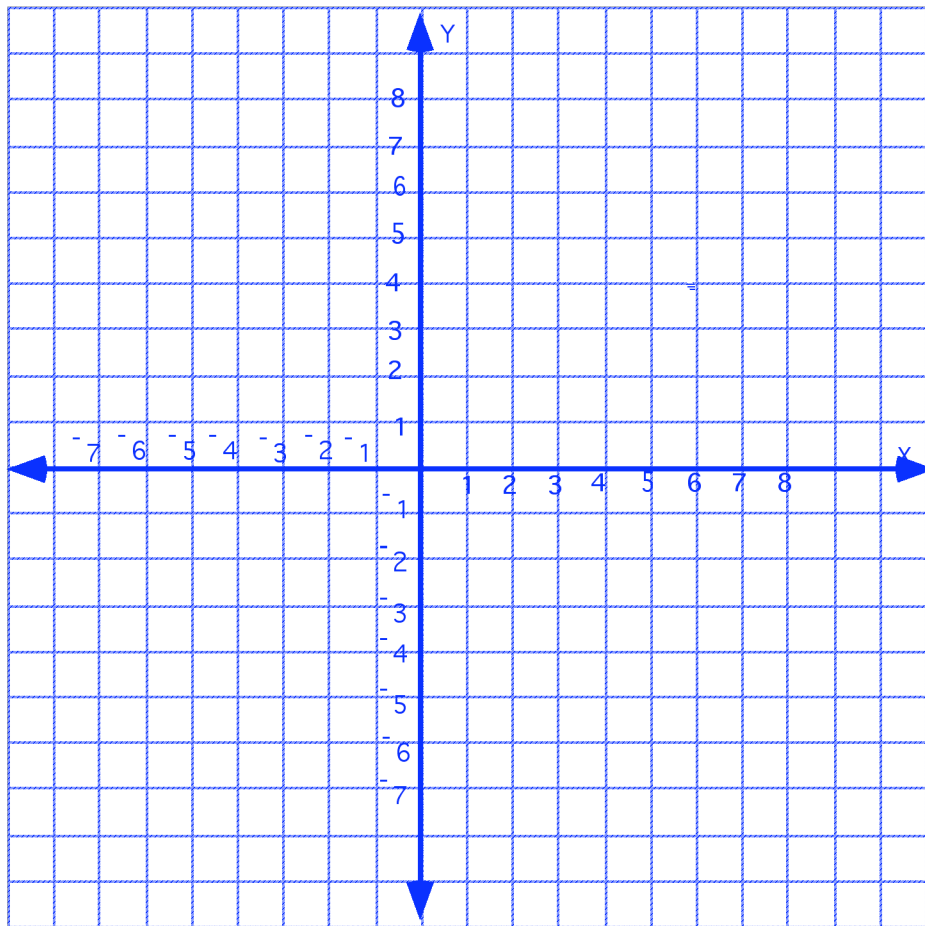
$$y = \frac{1}{3}x + 2 \quad m = \underline{\hspace{2cm}} \quad b = \underline{\hspace{1cm}} \quad y\text{-intercept } \underline{\hspace{2cm}}$$

$$2x + y = 5 \quad m = \underline{\hspace{2cm}} \quad b = \underline{\hspace{1cm}} \quad y\text{-intercept } \underline{\hspace{2cm}}$$

$$6x - 3y = 15 \quad m = \underline{\hspace{2cm}} \quad b = \underline{\hspace{1cm}} \quad y\text{-intercept } \underline{\hspace{2cm}}$$

6. Graph the following and label the graph:

$$y = \frac{3}{4}x - 2 \quad 4x + 2y = 4 \quad x = 4 \quad y = -2$$



7. Find the equation of the line whose slope is 2 and passes through the point (2, -1)

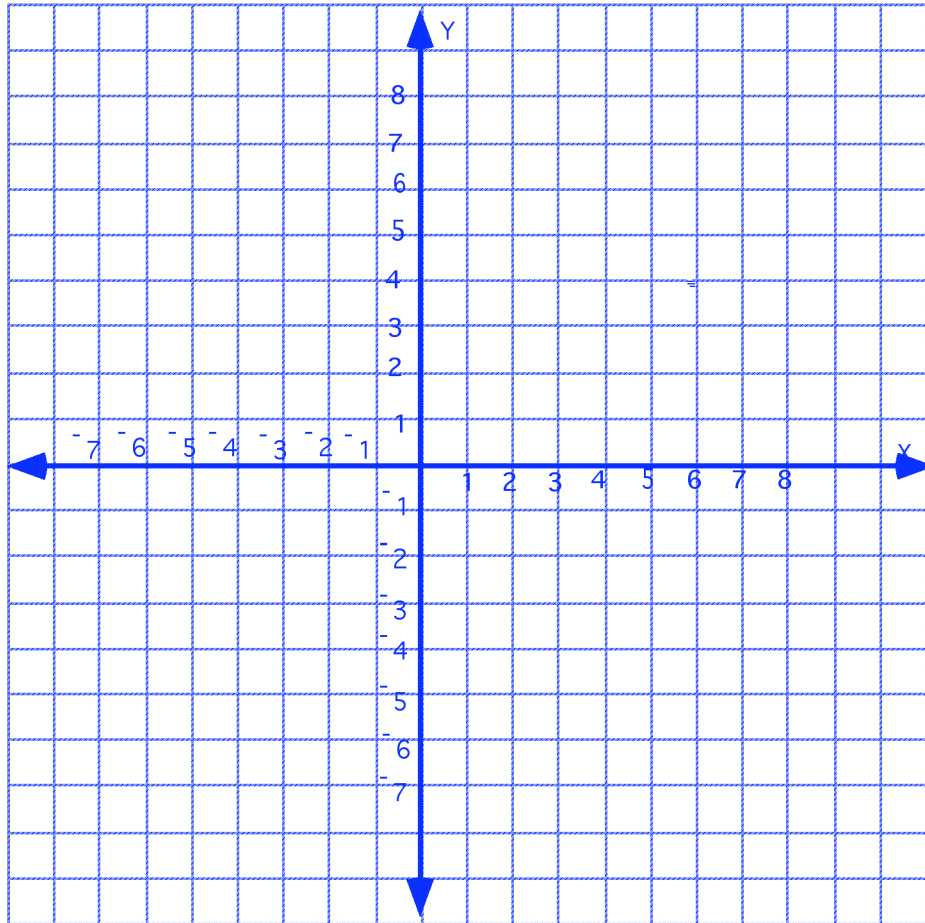
8. Find the equation of the line that passes through the points (-1 , -3) and (3,5).

9. Find the equation of the line that is parallel to the line $y = 2x + 3$ and passes through the point (2,3).

10. Solve Graphically and check:

$$y = -2x + 4$$

$$y = x + 1$$



11. Solve graphically and check:

$$x + 2y = 6$$

$$y - x = -3$$

