

## (A) Lesson Objectives:

- a. Introduce Parallel and Perpendicular Lines
- b. Write equations of lines using the parallel/perpendicular line relationships

## (B) Fast Five:

- a. Define PARALLEL:
- b. How do you KNOW if two lines are parallel?
- c. Define PERPENDICULAR:
- d. How would you KNOW if two lines are perpendicular?

## (C) Explorations:

- a. Graphing Calculator Investigation → Parallel Lines

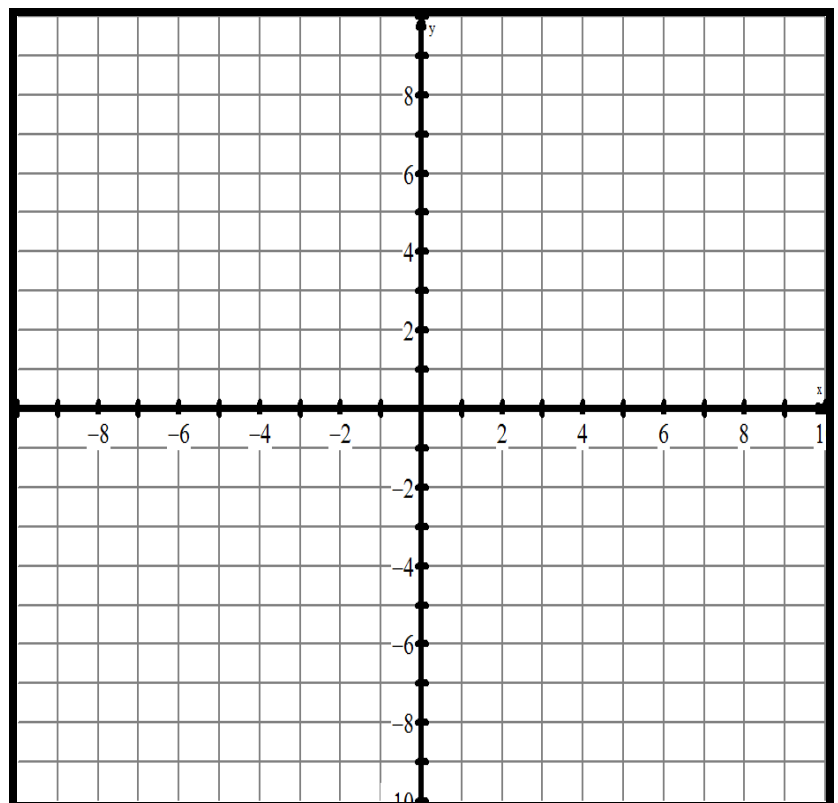
Graph the 4 lines on the same axes in a standard view window:

1. Graph the line  $y = 2x - 5$
2. Graph the line  $y = 2x - 2$
3. Graph the line  $y = 2x + 1$
4. Graph the line  $y = 2x + 4$

Observations:

1. What do the lines have in common?
2. What is different about the lines?

Graphs:

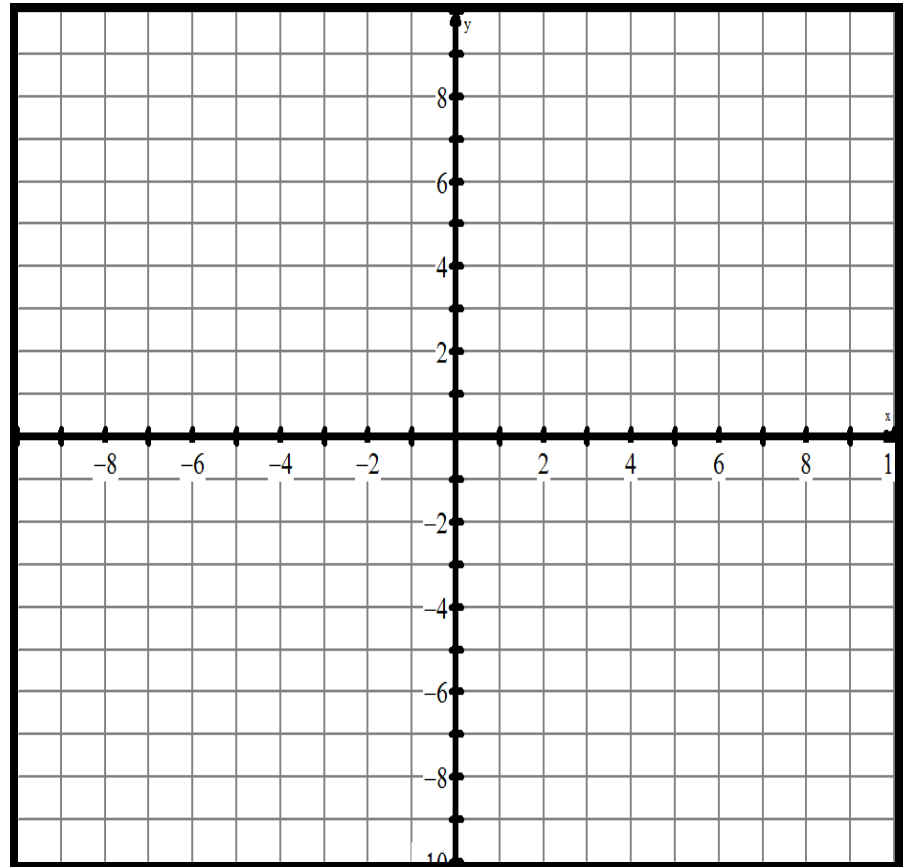


(C) Explorations:

b. Equation Writing Investigation → Parallel Lines

1. Graph the line  $y = -0.5x + 1$  on the grid
2. Graph the ordered pair (or point or coordinate)  $(3,5)$  on the graph.
3. DRAW the line that goes through the point  $(3,5)$  and is PARALLEL to our first line of  $y = -0.5x + 1$
4. Determine the EQUATION of the line you just drew.
  
5. Then plot the point  $(-2,-3)$  and DRAW the line that goes through this point and is parallel to our first line of  $y = -0.5x + 1$
6. Determine the EQUATION of the line you just drew.

Graphs:



(C) Explorations:

c. Graphing calculator Investigation → Perpendicular Lines

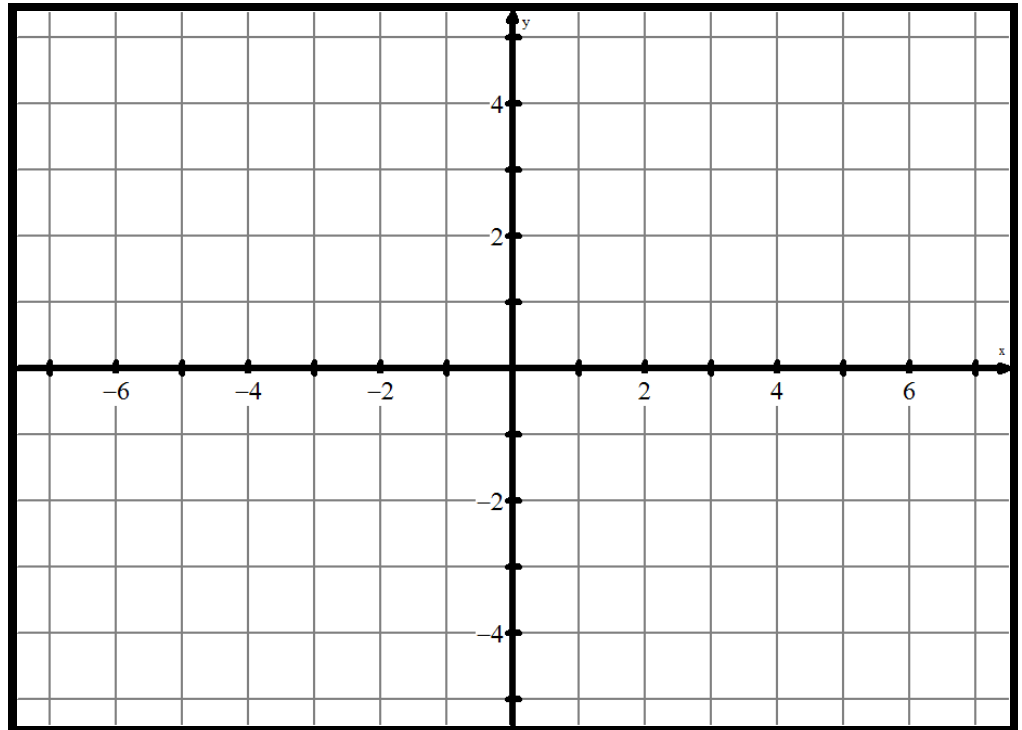
Graph the 2 lines on the same axes. On your TI84, use the following window settings:

Xmin = -5      Xmax = 5  
Ymin = -7.5    Ymax = 7.5

Then do a ZOOM SQUARE on your TI84

1. Graph the line  $y = 2x + 1$
2. Graph the line  $y = -0.5x - 2$

Graphs:



3. What do you notice about the lines?
4. What are the slopes of the two lines? (HINT: multiply the slopes together)

(C) Explorations:

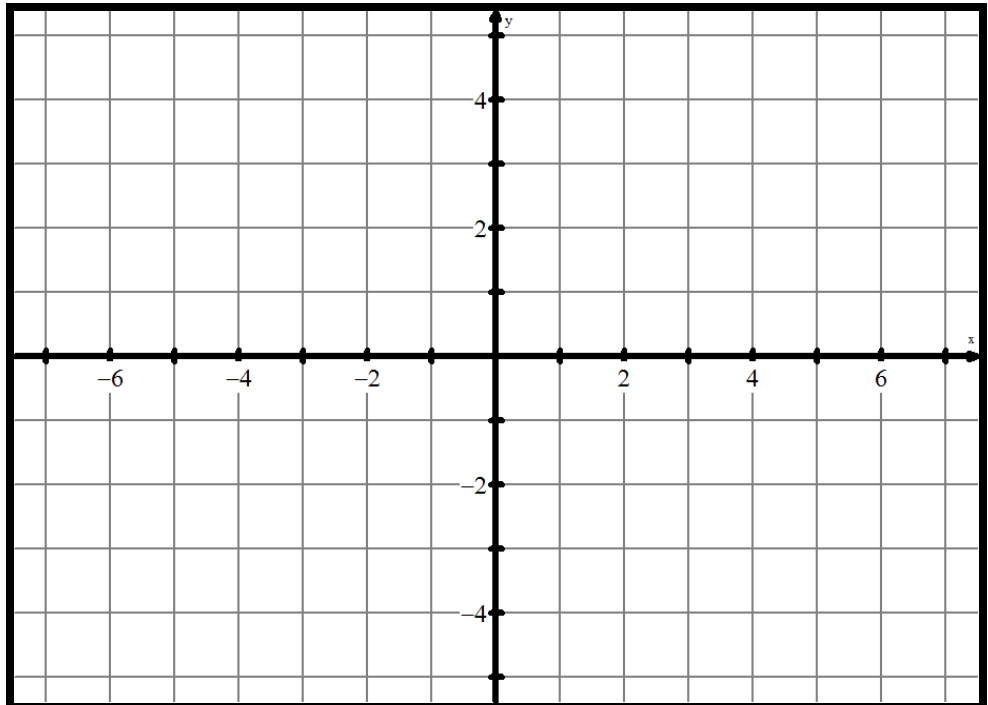
d. Graphing calculator Investigation → Perpendicular Lines

Using the same window settings,  
draw the lines

1. Graph the line  $y = 2/5x + 2$
2. Graph the line  $y = -5/2x - 1$

What do you notice about the  
lines?

What are the slopes of the two  
lines? (HINT: multiply the slopes  
together)

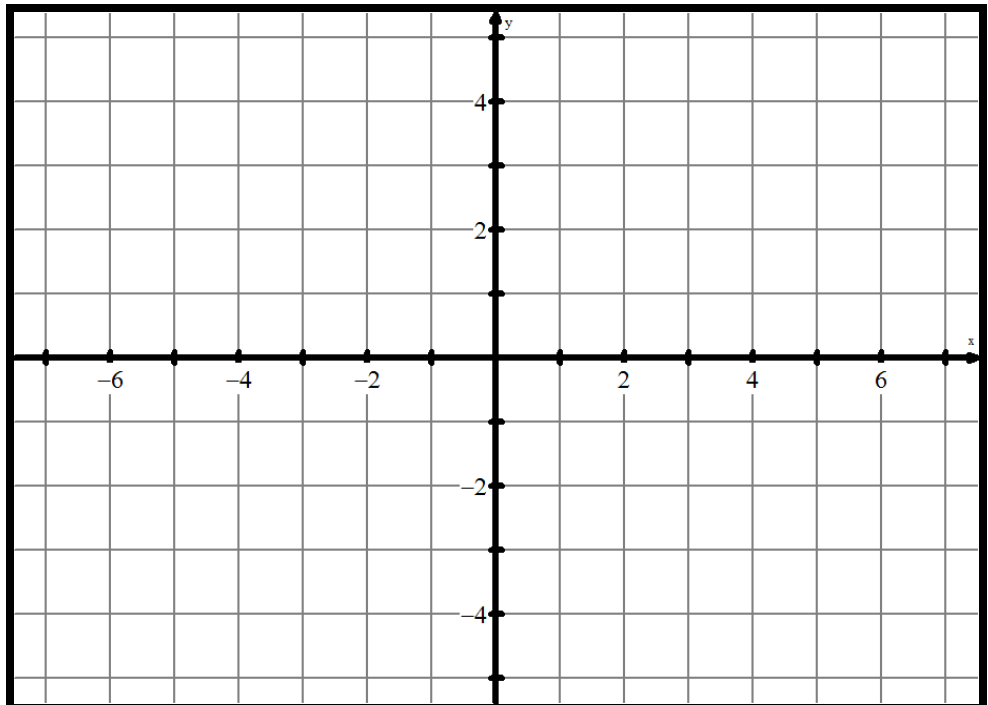


Using the same window settings,  
draw the lines

3. Graph the line  $y = -2/3x$
4. Graph the line  $y = 3/2x + 2$

What do you notice about the  
lines?

What are the slopes of the two  
lines? (HINT: multiply the slopes  
together)

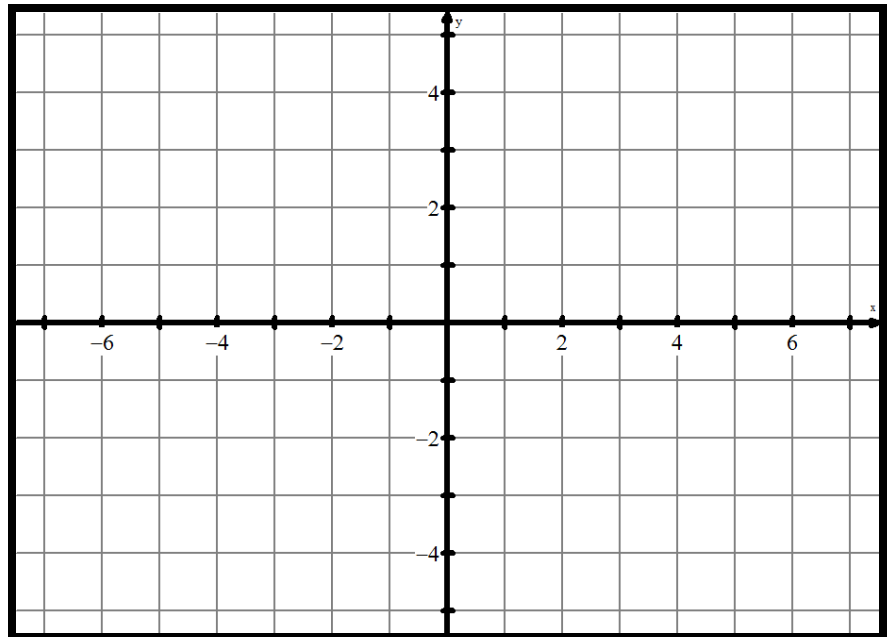


(C) Explorations:

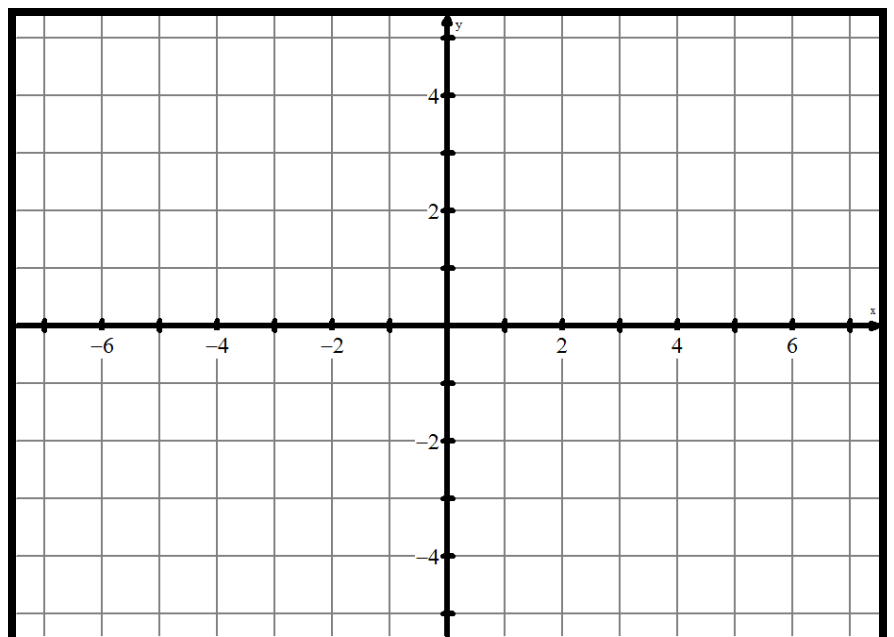
e. Equation Writing Investigation → Parallel Lines

1. Graph the line  $y = -0.5x + 1$  on the grid
2. Graph the point  $(3,1)$  on the graph.
3. DRAW the line that goes through the point  $(3,1)$  and is PERPENDICULAR to our first line of  $y = -0.5x + 1$
4. Determine the EQUATION of the line you just drew.

Graphs:



5. Then plot the point  $(-5,-2)$  and DRAW the line that goes through this point and is parallel to our first line of  $y = -0.5x + 1$
6. Determine the EQUATION of the line you just drew.



(D) Explorations – Geometry

f. Properties of Rectangle

Verbal Description:

You are going to investigate a property about rectangles, put into the context of slopes and lines

What is true about opposite sides of a rectangle?

What is true about adjacent sides of a rectangle?

Here are 4 points that you will graph and then connect to make a quadrilateral.

QUESTION → prove or disprove that the points I have given you form a rectangle

X	-8	-5	7	10
y	2	-7	-3	6

Workings:

