**THE PICTURE TELLS THE *LINEAR* STORY (Handout Created by Misty Jarman)**

\*\* Use your graphing calculator to investigate each family of equations.

\*\* Please sketch each family of equations on a separate sheet of graph paper.

\*\* Answer the questions for each on a separate sheet of paper.

**PART I.**

-- ***Graph the lines y = x, y = x + 6, y = x - 4***

Answer these questions:

1) How are the lines the same?

2) What is different about the lines?

3) Where does each line cross the y-axis?

4) What happens to the graph when a constant is added to y = x ?

5) Write an equation for a line similar to those above but crosses the y-axis at 5.

6) Write an equation for a line similar to those above but crosses the y-axis at -2.

**PART II**.

**-- *Graph the lines y = x and y = -x***

Answer these questions:

1) How are the lines alike?

2) How are the lines different?

**PART III.**

**-- *Graph the lines y = x, y = 2x, y = 5x, y = (1/2)x, y = (1/3)x, and y = (1/4)x***

Answer these questions:

1) Describe the differences in the graphs.

2) Which line appears the steepest?

3) What makes the difference?

**PART IV.**

**-- *Graph the lines y = -x, y = -2x, and y = -4x***

Answer these questions:

1) How are the lines different?

2) Which line appears the steepest?

3) What makes the difference?

**PART V.**

Practice:

1) Where does each of the following cross the y-axis?

y = 2x + 7 \_\_\_\_\_\_\_\_\_\_

y = -x + 11 \_\_\_\_\_\_\_\_\_\_

y = (1/2)x - 8 \_\_\_\_\_\_\_\_\_\_

2) Which line is the steepest and why.

y = x + 8 \_\_\_\_\_\_\_\_\_\_

y = 3x - 4 \_\_\_\_\_\_\_\_\_\_

y = (1/2)x + 3 \_\_\_\_\_\_\_\_\_\_

3) Which line is the steepest and why.

y = -x + 8 \_\_\_\_\_\_\_\_\_\_

y = -2x + 5 \_\_\_\_\_\_\_\_\_\_

y = -(1/3)x \_\_\_\_\_\_\_\_\_\_

4) If a linear equation can be written in the form y = mx + b, where m and b represent any real values, explain the effect of m on the graph of the equation.

Explain the effect of b on the graph.