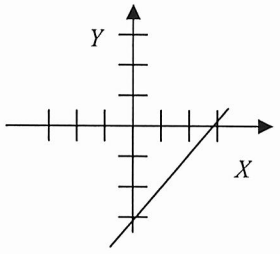
Name ----------
Date ---------- Per -------

Activity 2

Graphing Lines of the Form $y = mx + b$

Objective: In this lesson you will see how the constant b affects the line graph.

1. Use a graphing calculator to graph each equation and complete the following chart. An example is solved for you.

Equation	Value of *m*	Value of *b*	Sketch	*y*-intercept	*x*-intercept
$y = x - 3$	1	-3		(0,-3)	(3,0)
$y = x + 4$					
$y = x + 5.5$					
$y = 2x - 5$					
$y = 2x + 4.8$					

Exploring Linear Equations

Equation	*m*	*b*	sketch	*y*-intercept	*x*-intercept
$y = 3x - 2$					
$y = -3x + 7$					
$y = -3x$					

2. Use the results to answer the following questions.
   a. If *b* has a positive value, then the *y*-intercept is (above, below) the *x*-axis. Circle one answer.
   b. If *b* has a negative value, then the *y*-intercept is (above, below) the *x*-axis. Circle one answer.
   c. What is the *y*-intercept of the equation $y = 2x + 4$? _____
   d. What is the *y*-intercept of the equation $y = mx + b$? _____

3. Answer the following questions about the first three entries in Exercise 1.
   a. What is the same about all three graphs? _____
   b. These lines never intersect so we say they are _____
   c. What is the relationship between *b* and the *x*-intercept in these equations?
   _____
   d. What are the *x*- and *y*-intercepts of $y = x - 5$? _____
   e. How does changing the value of *b* affect graphs of the form $y = x + b$? _____
   _____

4. Describe and compare the graphs of $y = 3x - 1$ and $y = 3x + 2$. (Use a graphing calculator to help you see the graphs.) _____
   _____
   _____
5. Write an equation whose graph is a horizontal line. _____
6. Write an equation whose graph is a horizontal line through (0, 2.5). _____
7. Write an equation whose graph is a line parallel to and between the graphs of $y = 3x + 2$ and $y = 3x + 4.5$ _____
8. Write and equation whose graph is a line parallel to the graph of $y = -3x + 1$, but with *y*-intercept (0,-5). _____