

## Slope-Intercept Form of a Linear Equation

### Using the Graphing Calculator to Explore Linear Equations

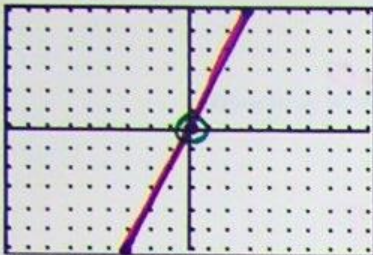
Graph each of the following equations. Set your calculator to the window to the right →

To turn on grid.... **2nd** **Format** → GridOn

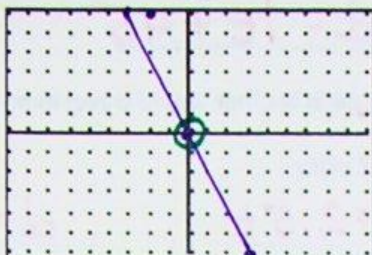
```

WINDOW
Xmin=-9
Xmax=9
Xscl=1
Ymin=-6
Ymax=6
Yscl=1
Xres=1
    
```

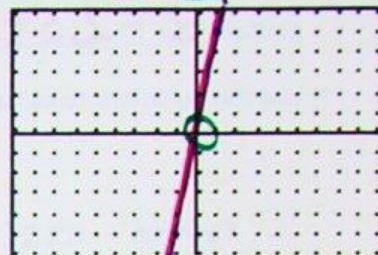
1.  $Y_1 = 2x + 0$



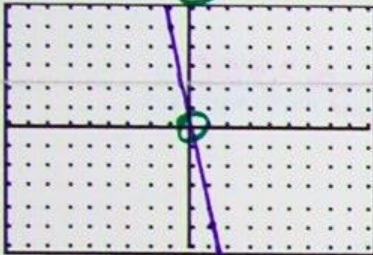
2.  $Y_1 = -2x + 0$



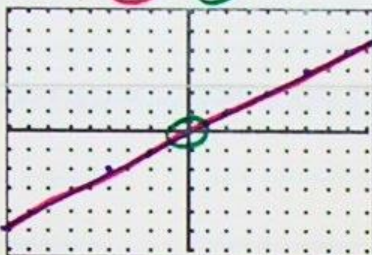
3.  $Y_1 = 5x + 0$



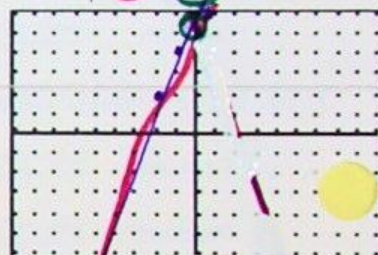
4.  $Y_1 = -5x + 0$



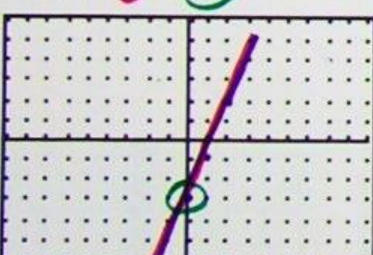
5.  $Y_1 = 0.5x + 0$



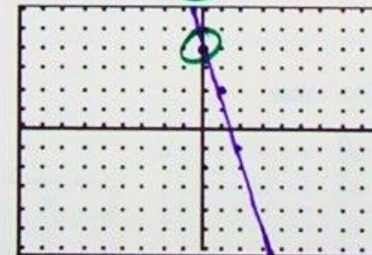
6.  $Y_1 = 2x + 5$



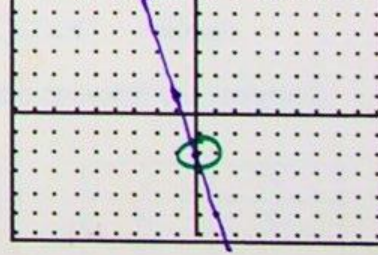
7.  $Y_1 = 2x + (-3)$



8.  $Y_1 = -2x + 4$



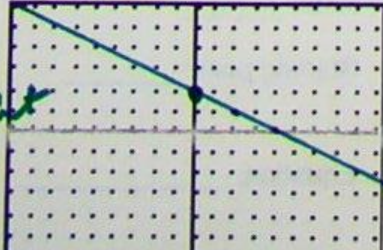
9.  $Y_1 = -3x + (-2)$



- All of these functions are lines in shape.
- If the co-efficient of x is positive, the graph goes in what direction? upward to the right
- If the co-efficient of x is negative, the graph goes in what direction? downward to the right
- If the absolute value of the coefficient of x increases, the graph is steeper
- The constant that is added to the x-term is the y-intercept (where the line crosses the y-axis)
- Sketch what you think these equations will look like when you graph them. Check using the TI-84.

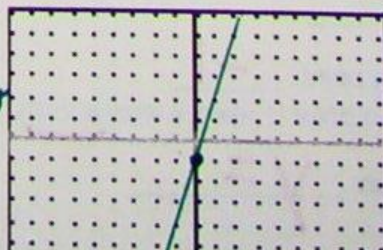
i.  $Y_1 = -0.5x + 2$

downward ↑  
y-int



ii.  $Y_1 = 3x + (-1)$

pos. (upward) ↑  
y-int



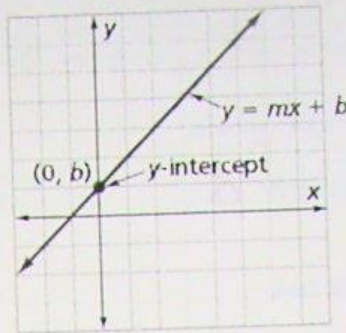
All of the linear equations we have studied so far can be written in the form  $y = mx + b$  or  $y = b + mx$ . In this equation,  $y$  depends on  $x$ .

# $y = mx + b$

Rate  
(steepness  
or slope)

Where it intersects the y-axis

y-intercept  
(where  $x=0$ )



The **y-intercept** is the point where the line crosses the  $y$ -axis, or when  $x = 0$ . To save time, we sometimes refer to the number  $b$ , rather than the coordinates of the point  $(0, b)$ , as the  $y$ -intercept.

A **coefficient** is the number that multiplies a variable in an equation. The  $m$  in  $y = mx + b$  is the coefficient of  $x$ , so  $mx$  means  $m$  times  $x$ .

For each table, tell the rate ( $m$ ) and coefficient ( $b$ ). Write an equation for each relationship.

#1	x	y
	0	5
	1	15
	2	25
	3	35
	4	45
	5	55

Rate (slope): 10  
 Starting point: 5  
 Equation:  $y = 10x + 5$

#2	x	y
	0	0
	1	15
	2	30
	3	45
	4	60
	5	75

Rate (slope): \_\_\_\_\_  
 Starting point: \_\_\_\_\_  
 Equation: \_\_\_\_\_

#3	x	y
	0	8
	1	15
	2	22
	3	29
	4	36

Rate (slope): \_\_\_\_\_  
 Starting point: \_\_\_\_\_  
 Equation: \_\_\_\_\_

#4	x	y
	0	-5
	1	-3
	2	-1
	3	1
	4	3

Rate (slope): \_\_\_\_\_  
 Starting point: \_\_\_\_\_  
 Equation: \_\_\_\_\_

#5	x	y
	0	-10
	1	-6
	2	-2
	3	2
	4	6

Rate (slope): \_\_\_\_\_  
 Starting point: \_\_\_\_\_  
 Equation: \_\_\_\_\_

#6	x	y
	0	10
	1	20
	2	30
	3	40
	4	50

Rate (slope): \_\_\_\_\_  
 Starting point: \_\_\_\_\_  
 Equation: \_\_\_\_\_