

5.4 GRAPHING LINES USING SLOPE AND Y-INTERCEPT

There are several different methods which can be used to graph an equation.

- creating a table of values (already learned)
- slope-intercept method
- x & y-intercept method

Once you know all methods you will be allowed to use the method you find most convenient. Some methods are more convenient than others depending on the way the equation is written.

Slope - Intercept Form of an Equation: is written so that you have a point and a slope. (you learned in 5-1 how to graph a line with a point and a slope)

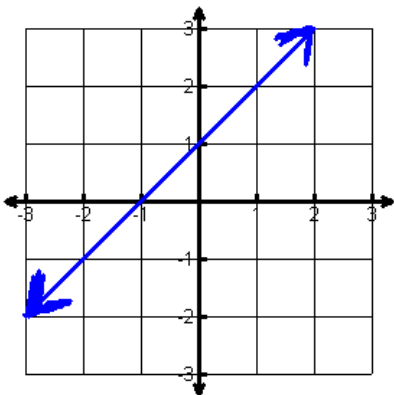
Equation form: $y = mx + b$ where $m = \text{slope}$ and $b = \text{the } y\text{-intercept}$

EX: Identify the slope and y-intercept of each equation and describe what this line looks like.

1) $y = 2x + 6$ 2. $y = -x - 1$ 3. $y = \frac{2}{3}x + 2$ 4. $y = 8$

definition of intercept: the point where the line intersects (crosses) that axis

- y-intercept: the point where the line crosses the y-axis
- x-intercept: the point where the line crosses the x-axis

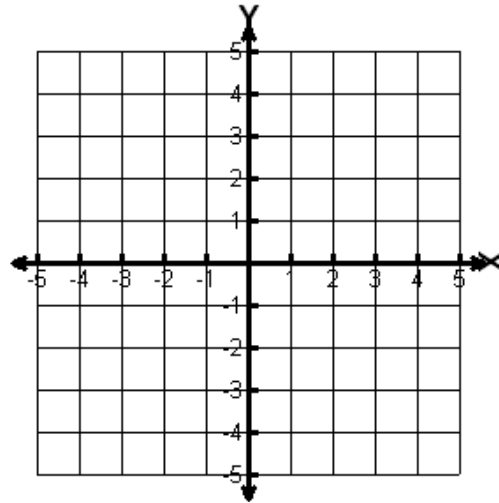


An equation written in the slope-intercept form can be used to draw a quick graph without having to make up a table of values.

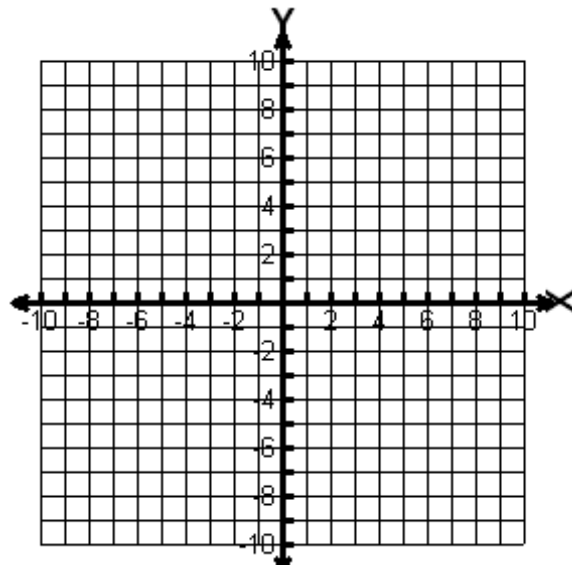
- 1) plot the y-intercept point (b)
- 2) to find another point - use the slope to count units up or down and left or right
- 3) plot the second point (you can continue until you get several points)
- 4) draw a line to connect the points

Example: Use each equation below to draw a quick graph

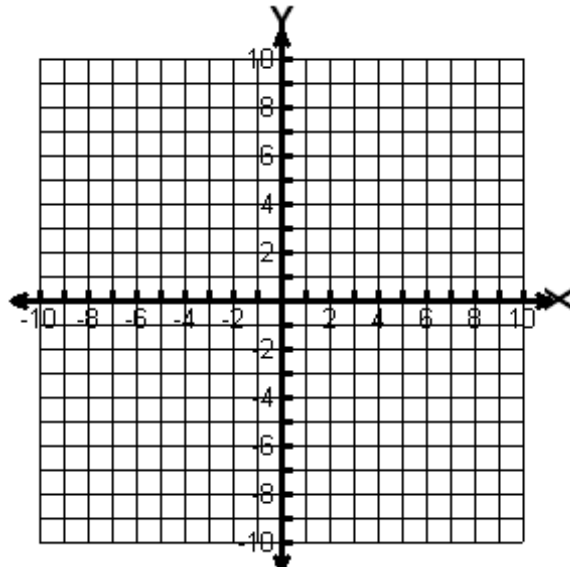
1) $y = 2x + 1$



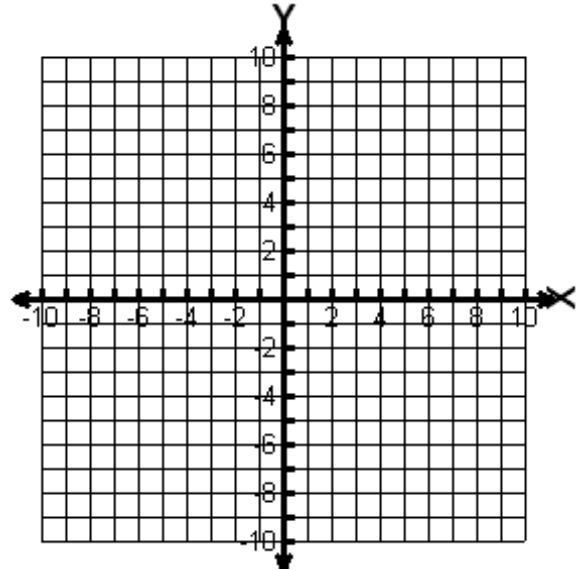
2) $y = -2x + 3$



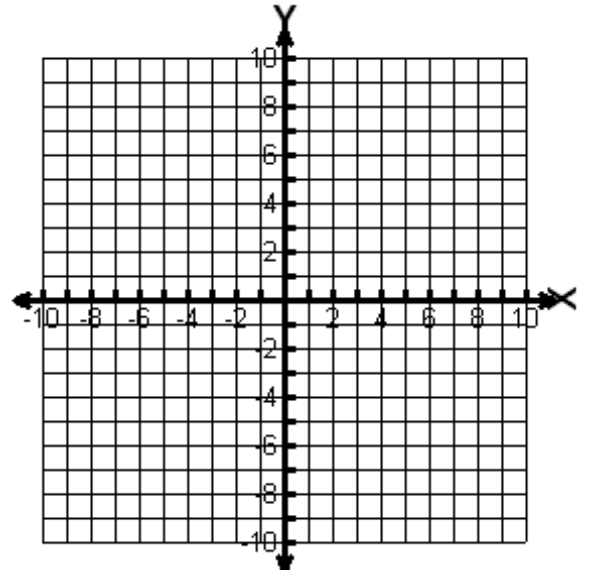
3) $y = \frac{1}{3}x - 3$



4) $y = -4x$



5) $y = -6$



(5-4) Write the equation of a line given the slope & y-intercept.

- You must give the equation $y = mx + b$
- You will fill in the slope and y-intercept (b) values

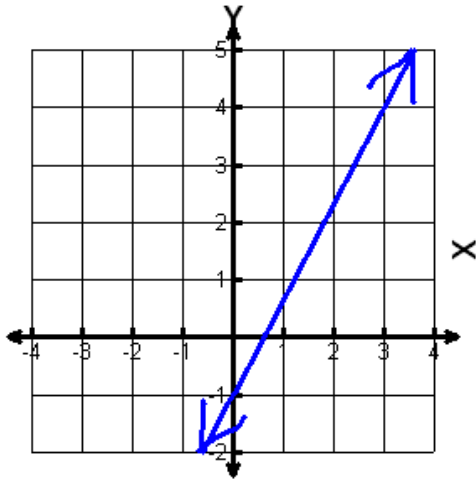
Example: Use the information to write the equation in slope-intercept form

1. $m = 3$ and $b = -6$ 2. $m = 0$ and $b = 3$ 3. $m = \frac{1}{2}$ and $b = 0$

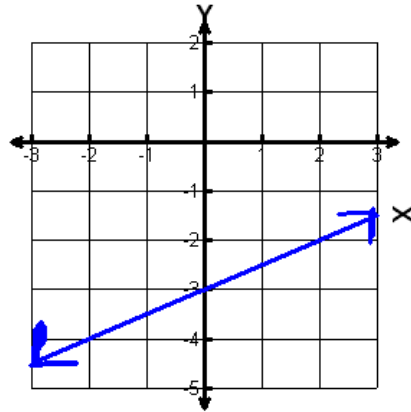
4. $(0, 5)$ with undefined slope 5. slope is $-\frac{2}{3}$ with $(0, 7)$

Example: Use the information from the graph to write an equation for each line.

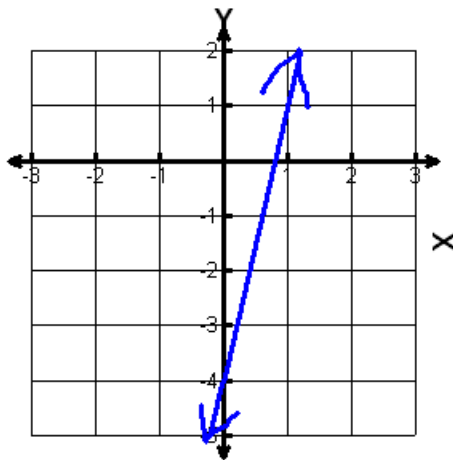
1)



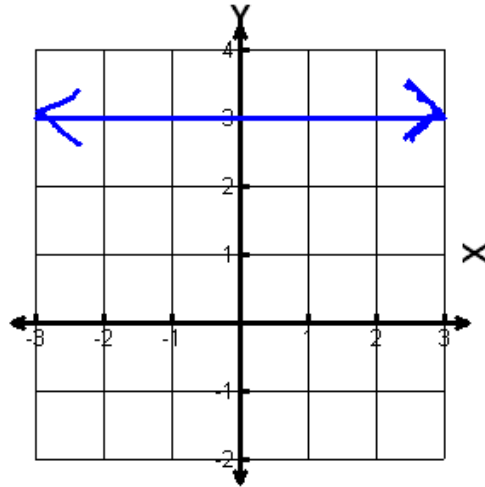
2)



3)



4)



(5.4) Change Equations to Slope-Intercept Form:

If you prefer to graph using the slope-intercept method you can still change an equation into the preferred form.

- get y by itself on the left side
- move all other terms to the right side
- put all terms on the right side in the order of $mx + b$

Example: Change each equation into the slope-intercept form $y = mx + b$

1. $y + 3 = -\frac{1}{3}x$

2. $y - \frac{3}{5}x = -1$

3. $y + 3x = 6$

4. $2x + y = 0$

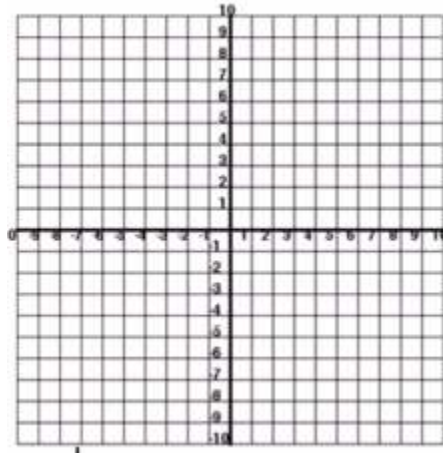
5. $x - y = -6$

6. $y - 3 = 7$

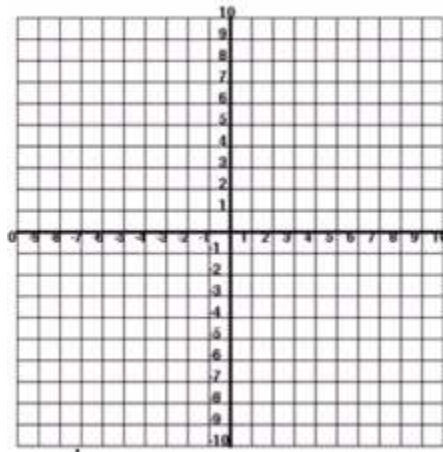
7. $2x + 4y = 8$

Graph each equation using slope-intercept method:

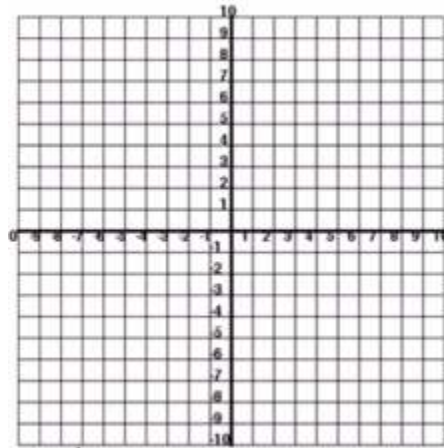
1. $y + \frac{1}{5}x = -2$



2. $y + x = 0$



3. $y + 5 = 8$



4. $2x + y = 6$

