

5-4-2 Slope Intercept Form

The y-intercept is the point where a line crosses the y axis. At this point the value of x is 0.
 To find the y-intercept, plug 0 in for x in the linear equation and solve for y.
 To find the x-intercept, plug 0 in for y and solve for x.

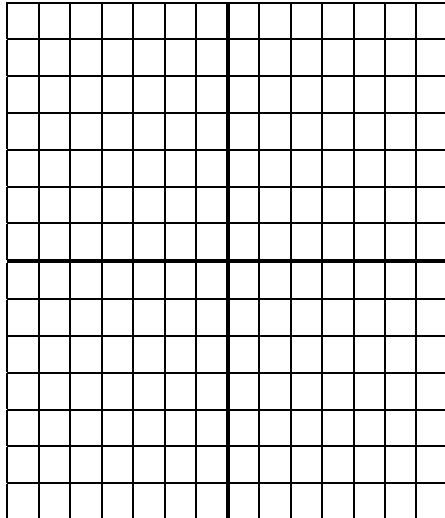
Graph the following. Plot two points, the y-intercept and the x intercept. Then find the slope of the line.

a) $y=3x-6$

x	y
0	
	0

$$m = \frac{y_2 - y_1}{x_2 - x_1}$$

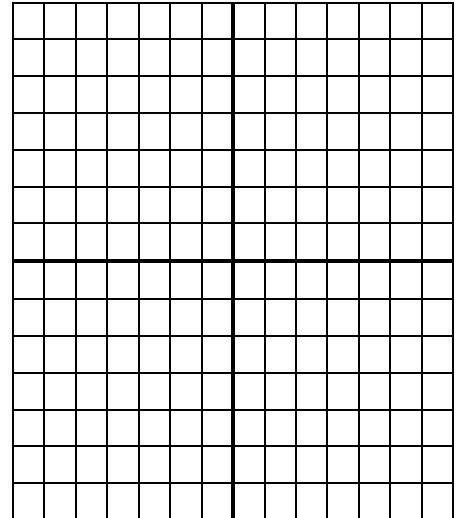
$$m = \frac{0 - y_1}{x_2 - 0}$$



b) $y= - 2x + 4$

x	y
0	
	0

$$m = \frac{y_2 - y_1}{x_2 - x_1}$$

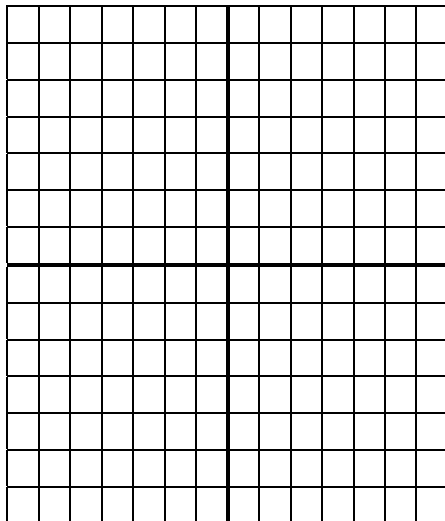


c) $y=\frac{1}{2} x - 3$

x	y
0	
	0

$$m = \frac{y_2 - y_1}{x_2 - x_1}$$

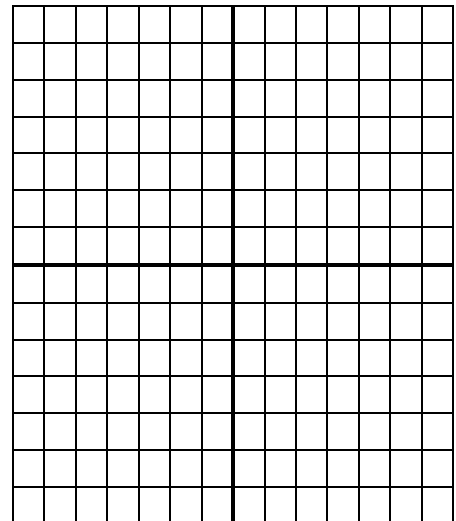
$$m = \frac{0 - y_1}{x_2 - 0}$$



d) $y= - \frac{3}{4} x + 6$

x	y
0	
	0

$$m = \frac{y_2 - y_1}{x_2 - x_1}$$



Observe the equations, the slope you found, and the y value for the intercept.
 Do you see the intercept included in the equation? Do you see the slope?

$y=mx+b$ is the **Slope Intercept** form of a linear equation. There are other ways to write a linear equation. To get slope intercept form, solve for y and put the x term first and constant last.
 The m in the equation is the slope. In question (d) above the slope is $-\frac{3}{4}$. $-\frac{3}{4}$ is multiplied by the x in the equation. The b is 6.
 The b in the slope-intercept equation is the y intercept. The line will cross the y axis at (0,b)

Example: $y= \frac{4}{5} x - 8$ has slope $m=\frac{4}{5}$ and intercept (0, -8)

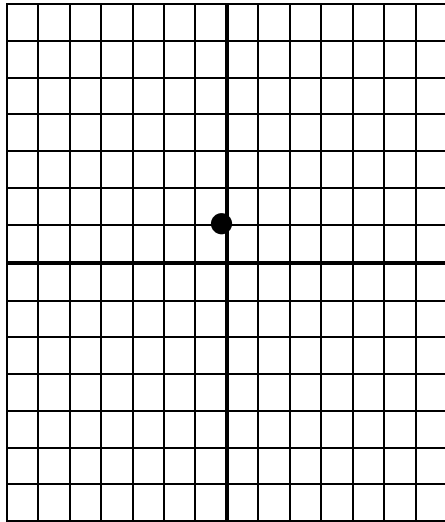
Practice: Read the slope and intercept from the following equations.

- | | | | |
|---|---|---|-----------------------|
| a) $y = 5x + 3$
slope, $m =$
Intercept $(0, \quad)$ | $y = 3x + 1$ | $y = \frac{3}{4}x + 3$ | $y = x + \frac{2}{3}$ |
| b) $y = \frac{2}{3}x - 7$
slope, $m =$
Intercept $(0, \quad)$ | $y = \frac{1}{2}x - 4$ | $y = x - 7$ | $y = -6x + 9$ |
| c) $y = -3x + 3$
slope, $m =$
Intercept $(0, \quad)$ | $y = 5x$
(What can be added and
not change the equation?) | $y = 0.2x + 3$
(Write the slope as a
fraction.) | $y = -x - 3$ |

The slope intercept form makes graphing linear equations very quick and easy.

Example: $y = 3x + 1$

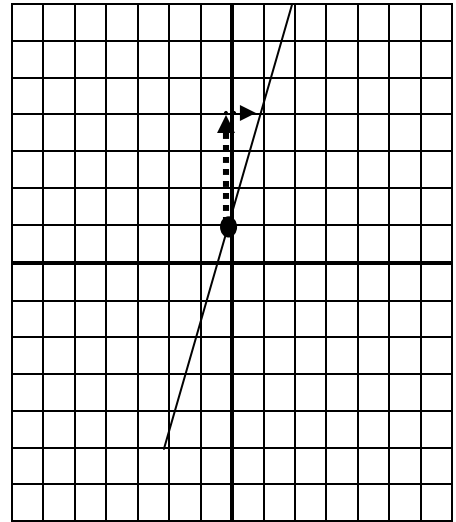
1. Plot the intercept.
 $(0, 1)$



2. Write the slope as a fraction. $3/1$

On the graph rise 3 and run 1 from the starting point of $(0, 1)$.

Connect the points.



Graph the equations given in a, b, and c above. There is room for three here. You may use your own graph paper for the others.

