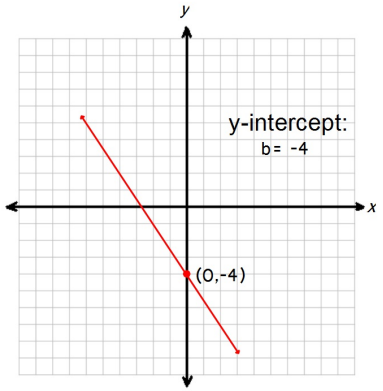
9.5 Quick Graphs of Linear Equations

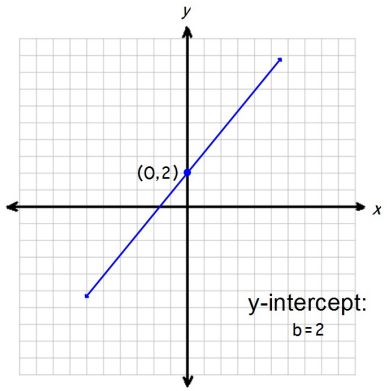
Objectives :

- Use the slope-intercept form of a linear equation to graph linear equations .
- Use the standard form of a linear equation to graph linear equations .

If the graph of an equation intersects the y-axis at the point (0,b) then the number b is the **y-intercept** of the graph.

(The y value when we set x=0)





The **slope - intercept** form of a linear equation is y = mx + b, where *m is the slope* of the line and *b is the y-intercept .*

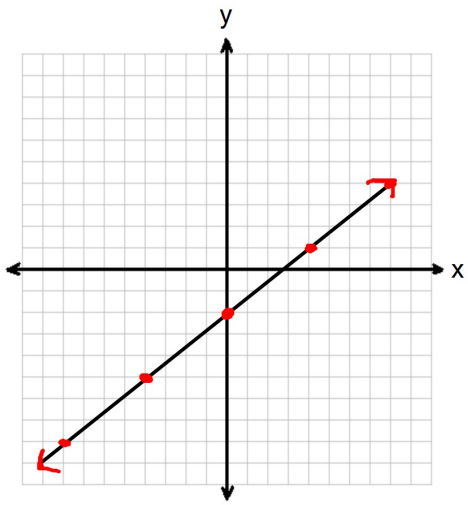
Graphing Equations in Slope - Intercept Form

1. Write the equation in slope-intercept form by solving for y.
2. Find the y-intercept and use it to plot the point where the line crosses the y-axis.
3. Find the slope and use it to plot a second point on the line.
4. Draw a line through the two points .

Example 1: Graphing with the Slope - Intercept Form

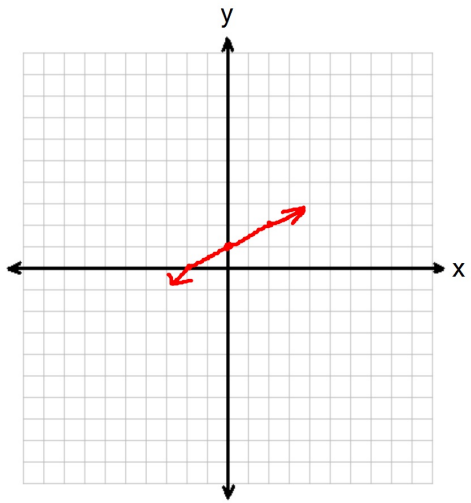
a. Graph $y = \frac{3}{4}x - 2$

1. $y = \frac{3}{4}x - 2$
2. b = -2
3. m = $\frac{3}{4}$ $\frac{\text{rise}}{\text{run}}$
4. Draw the line



Now on your own :

b. Graph $y = \frac{1}{2}x + 1$



1. $y = \frac{1}{2}x + 1$
2. b = 1
3. m = $\frac{1}{2}$
4. Draw the line

The **standard form** of a linear equation is Ax + By = C where A and B are not both zero.

The **x-intercept** of a line is the x-coordinate of the point where the line intersects the x-axis. (The x when we let y = 0)

Graphing Equations in Standard Form

1. Write the equation in standard form.
2. Find the x-intercept by letting y = 0 and solving for x and then plot the x-intercept.
3. Find the y-intercept by letting x = 0 and solving for y and then plot the y-intercept.
4. Draw a line between the two points.

Example 2:

Graph 2x + 3y = 12

$-2x \quad 3y = -2x + 12 \quad -2x$

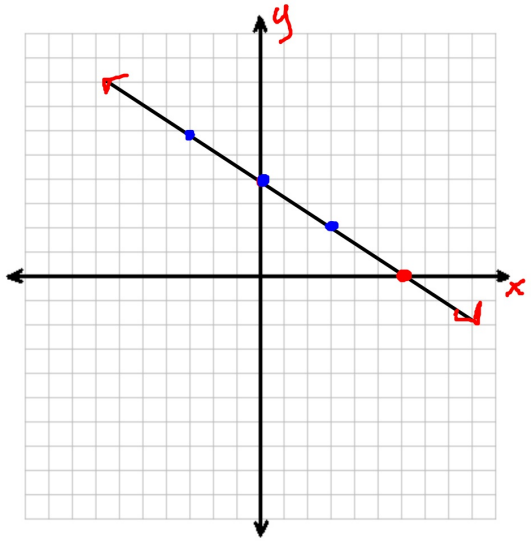
$\div 3 \qquad \div 3$

Use standard form

1. 2x + 3y = 12
2. x-intercept : 6
3. y-intercept : 4
4. Draw the line

Use slope-intercept form

1. $y = -\frac{2}{3}x + 4$
2. b = 4
3. m = $-\frac{2}{3}$ $\quad \frac{-2}{3} \quad \frac{2}{-3}$
4. Draw the line



Horizontal and Vertical Lines

Horizontal Lines : The graph of y=c is the horizontal line through (0,c)

Vertical Lines : The graph of x=c is the vertical line through (c,0)

Example 3: Graphing Horizontal and Vertical Lines

a) y = 3

b) x = -2