**Beginning Algebra ~ Lesson 21**

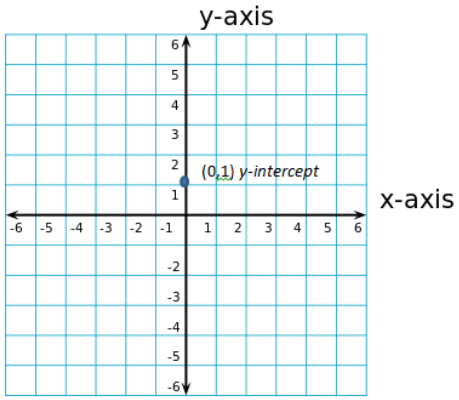
Work the following examples as you listen to the recorded lecture.

**Graphing a line using slope and y-intercept**

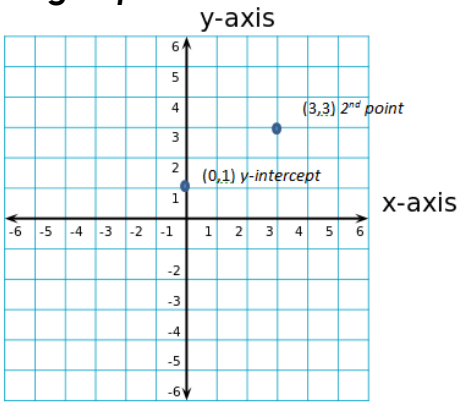
Graphing a line is easy if you know a point on the line and the slope. Since the slope-intercept form of the linear equations tells us the y-intercept, which is a point on the line, and the slope of the line, we can quickly graph the line on the rectangular coordinate system graph.

For example, let's look at the linear equation $y = \frac{2}{3}x + 1$. We recognize slope-intercept form, and can easily find the slope of the line, which is $\frac{2}{3}$, and the y-intercept, (0,1). The example below shows the steps taken to graph this line:

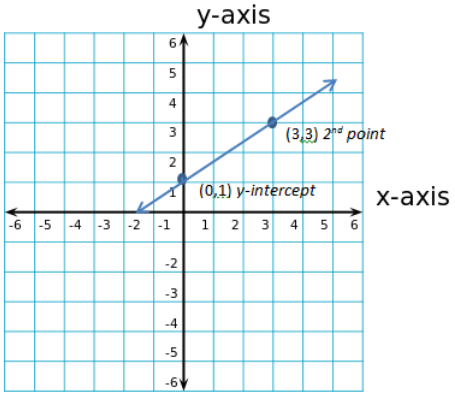
***Step 1:***
***Find the y-intercept and place it on the graph***




***Step 2:***
***Find the next point on the line by following the slope. Since the slope is always $\frac{Rise}{Run}$, we move up the number of spaces in the numerator and over the number of spaces in the denominator. In this case, we go up 2 and over 3.***



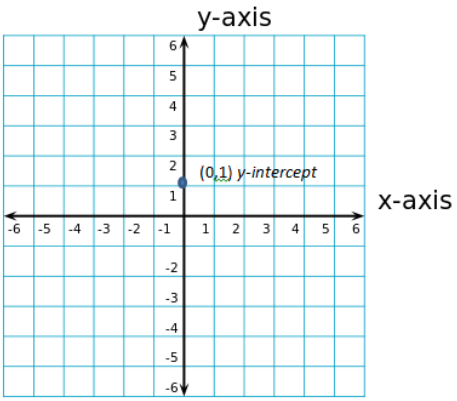

***Step 3:***
***Since 2 points are all we need to graph a line, we draw a line through our 2 points to complete the graph. This is the graph for $y = \frac{2}{3}x + 1$.***



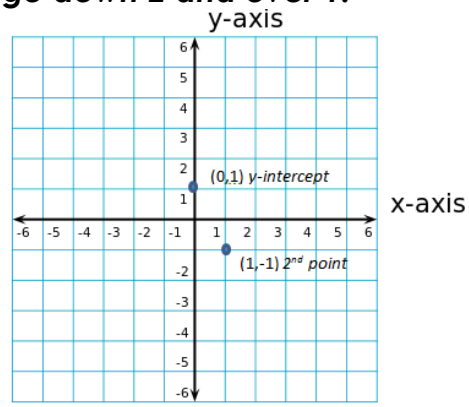
**Graphing a line using slope and y-intercept, page 2**

Let's look at another example, $y = -2x + 1$ , and see what happens when our slope is negative. This linear equation is in slope-intercept form, so we have a slope of -2 and a y-intercept of (0 , 1). Since the slope is a whole number, we need to write it as a fraction so that we have both rise and run. We'll always leave the negative in the numerator to make it easier to graph, so our slope is $\frac{-2}{1}$ . Now we are ready to graph the line:

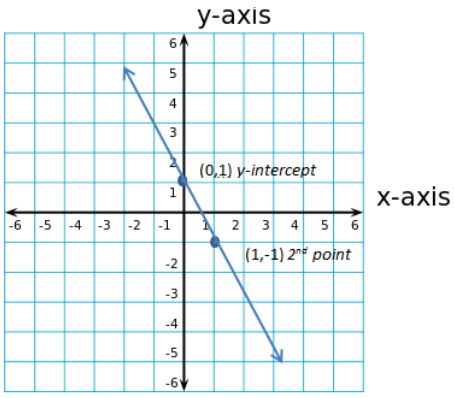
***Step 1:***
***Find the y-intercept and place it on the graph.***




***Step 2:***
***Find the next point on the line by following the slope. Since the rise of the slope is negative, we move down the number of spaces in the numerator and over the number of spaces in the denominator. In this case, we go down 2 and over 1.***




***Step 3:***
***Now, draw a line through our 2 points to complete the graph. This is the graph for*** $y = -2x + 1$.




***Remember….***

You can graph a line if you have the y-intercept and the slope.

First, find the y-intercept on the graph.

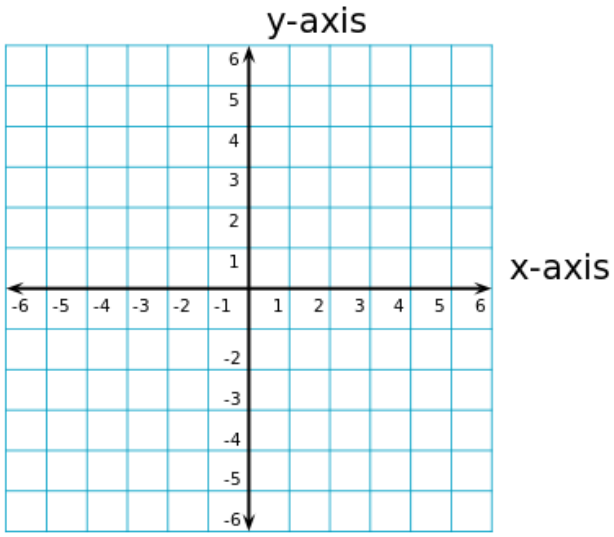
Next, find the 2nd point on the line by using the slope; go up or down the number of spaces in the numerator and go over the number of spaces in the denominator.

Finally, draw the line through the two points.

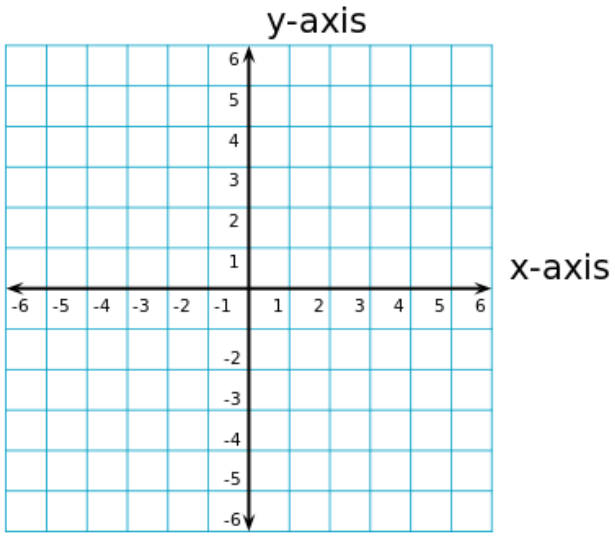
**Graphing a line using slope and y-intercept, page 3**

Use y-intercept and slope to complete the graphs.

***Line 1:*** $y = -\frac{1}{4}x + 2$




***Line 2:*** $y = x - 3$




***Line 3:*** $y = 2x - 1$