BEGIN UNIT 4: LINEAR SYSTEMS

slope-intercept form!

(b) (m)

I can graph lines in $y = mx + b$ form using the slope and y-intercept.

Graphing Lines, $y = mx + b$ using y-intercept and slope

The formula $y = mx + b$ is said to be a linear function. That is the graph of this function will be a straight line on the (x, y) plane. One could express this as a formal function definition with notation such as:

$f(x) = mx + b$ (y)

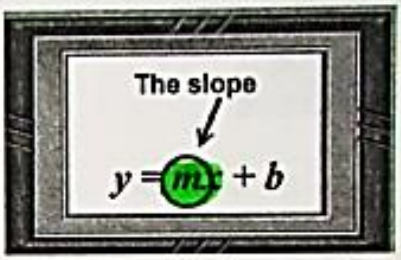
Since we will be graphing (x, y) points, though, we will do our thinking with the '$y = mx + b$' form for a while.

When the function for a line is expressed this way, we call it the 'slope-intercept form'.

Where is the slope? up or down, how steep ? ?

The slope of the line is the variable m.

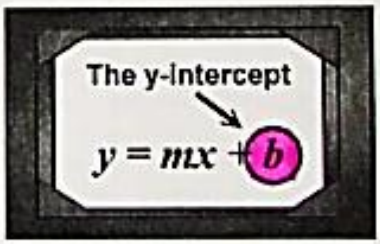
The slope describes the *slant* of the line.



Where is the intercept? "starting point"

By *'intercept'* we mean *'y-intercept'*.
The y-intercept is held by the variable b.

The y-intercept is the point where the line crosses the y-axis.



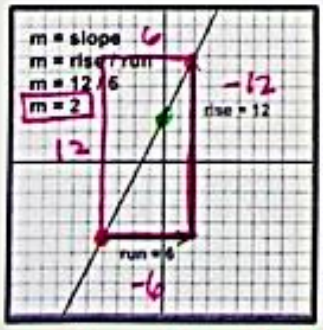
m

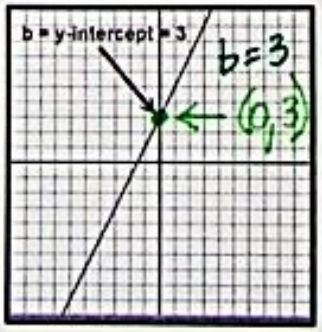
If you know the slope for the line....

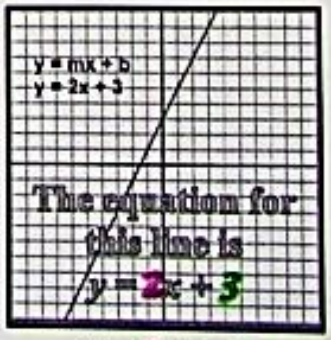
b

and you know the y-intercept for the line....

then you can write the slope-intercept equation for the line.







$m = \frac{-12}{-6} = \frac{12}{6} = \boxed{2}$

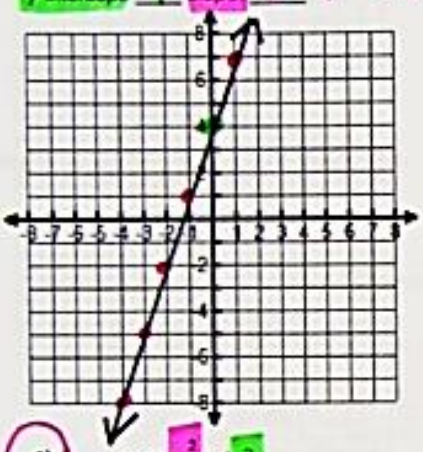
$y = 2x + 3$

slope-intercept form

Graph the following lines using the y-intercept and slope.

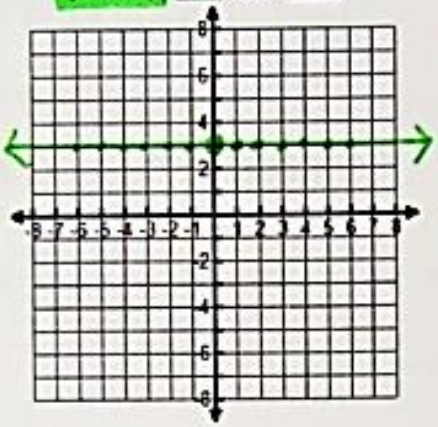
1) $y = 3x + 4$

y-intercept: 4 slope: 3 $\frac{3}{1}$ or $\frac{-3}{-1}$



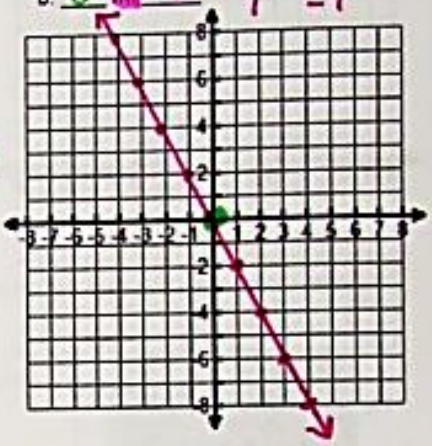
2) $y = 3$ $y = 0x + 3$

y-intercept: 3 slope: ____



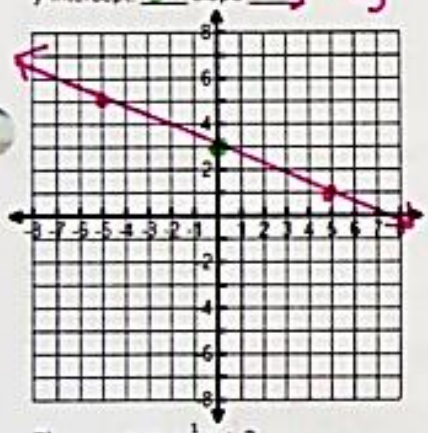
3) $y = -2x + 0$

b: 0 m: -2 $\frac{-2}{1}$ or $\frac{2}{-1}$



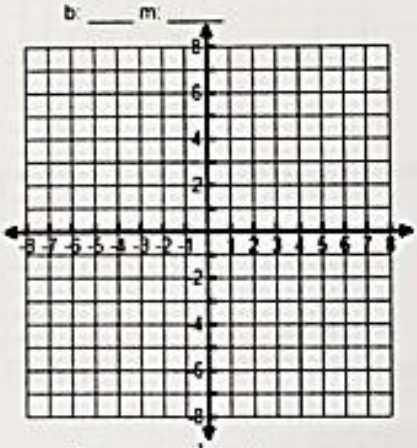
4) $y = -\frac{2}{5}x + 3$

y-intercept: 3 slope ____ $\frac{-2}{5}$ or $\frac{2}{-5}$



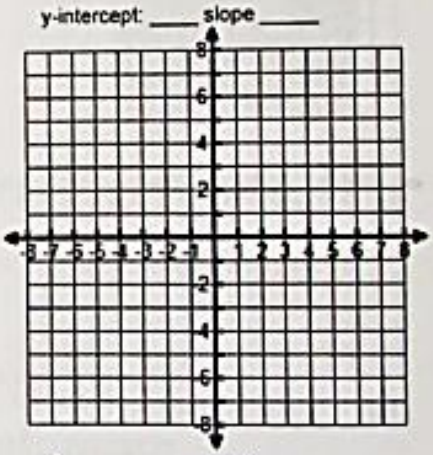
5) $y = \frac{1}{2}x + 4$

b: ____ m: ____



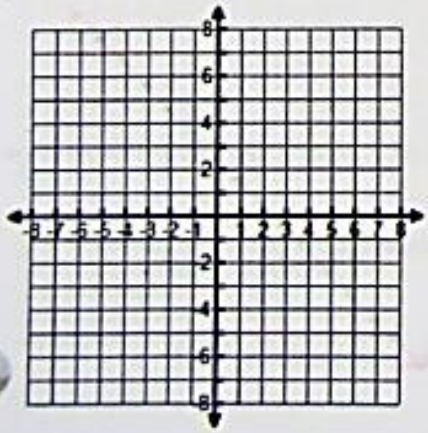
6) $y = x - 4$

y-intercept: ____ slope ____



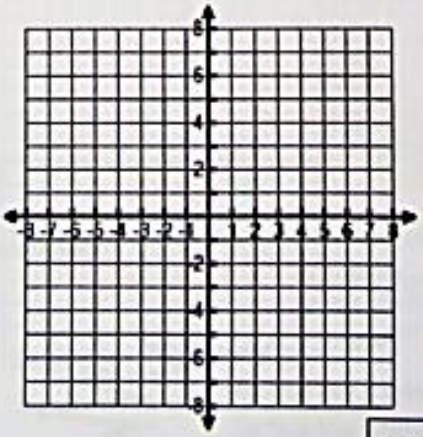
7) $y = -\frac{1}{2}x + 3$

b: ____ m: ____



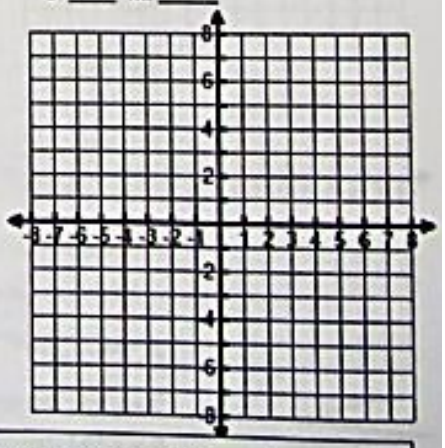
8) $y = \frac{1}{3}x - 4$

y-intercept: ____ slope ____



9) $y = -x + 3$

b: ____ m: ____



Homework is continued