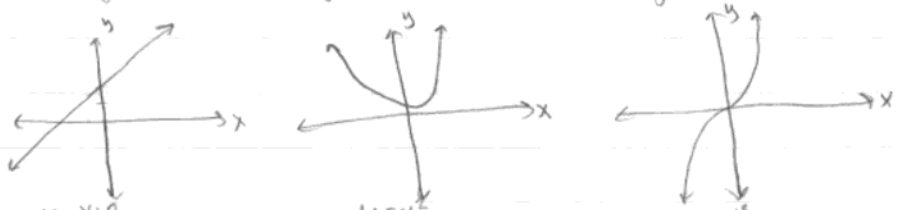
3.2

Friday, August 24, 2012
10:27 AM

Linear Equations

Linear Equation - equation whose graph is a line.

ex



Standard Form of a Linear Equation

If A, B, and C are real numbers (A, B ≠ 0)

$Ax+By=C$

Identifying Linear Equations

book - try to write the equation in Standard form

if it's $Ax+By=C$ then it's linear; else not

Me - linear equations - nothing "funny" just x and y, no powers, no $\sqrt{}$, no $\frac{1}{}$, etc.

ex Decide if each is linear

$2x+3=4y-5$ yes, no funny stuff

or $2x+3-4y=-5$

$2x-4y=-5-3$

$2x-4y=-8$ so $A=2, B=-4, C=-8$. so yes

$5x^2-y^4-2=10$ no, has powers

or $5x^2-y^4=12$ so no

$\frac{1}{4}x+\frac{9}{210}y=\frac{1}{3000}$ yes, $A=\frac{1}{4}, B=\frac{9}{210}, C=\frac{1}{3000}$

Graphing Linear Equations

We only need two points to draw a line
(however a 3rd will check)

Steps to Graphing a Linear equation

1. Find 3 points (x, y)
2. Plot these three
   (if they don't line up ⇒ mistake)
3. Draw the line between points

(ex) $2x+4y=8$

x	y
	2
	2
	1

$\rightarrow y = 2$

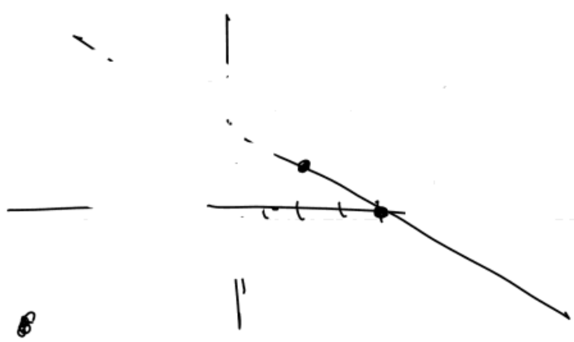
$2x =$ $= 4$

$2 * 2 \quad 4y = 8$

$4 + 4y = 8$

$\frac{4y}{4} = \frac{4}{4}$

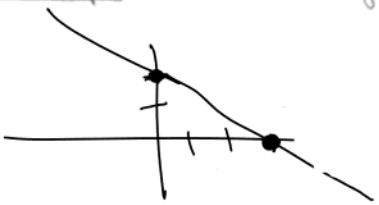
$y = 1$



The Intercept Method

y-intercept - where a graph hits the y-axis
x-intercept - where a graph hits the x-axis

ex



∴ x-int = 3
y-int = 2

Notice: graph hits y-axis when x=0 and
" x-axis when y=0
So to find y-intercept set x=0
to find x-intercept set y=0

ex What's the x- and y-intercept of $y=2x+3$

y-intercept: set x=0, solve for y

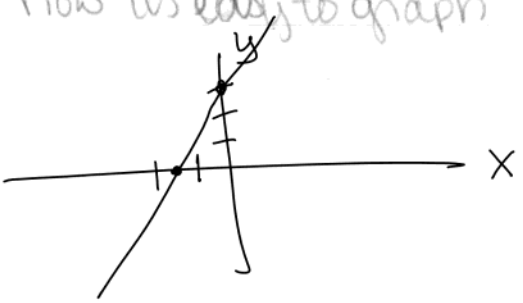
$y=2*0+3$
$y=0+3$
$y=3$

x-intercept: set y=0, solve for x

$0=2x+3$
$-3 \quad -3$
$\frac{-3}{2}=\frac{2x}{2}$

$x=-3/2$

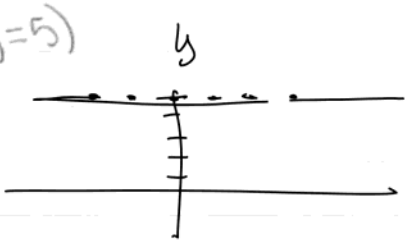
Now it's easy to graph



Graphing Horizontal and Vertical Lines

ex $y=5$ (or $0x+y=5$)

x	y
2	5
0	5
100	5



ex $x=2$ (or $x+0y=2$)

x	y
2	-5
2	0
2	
2	
2