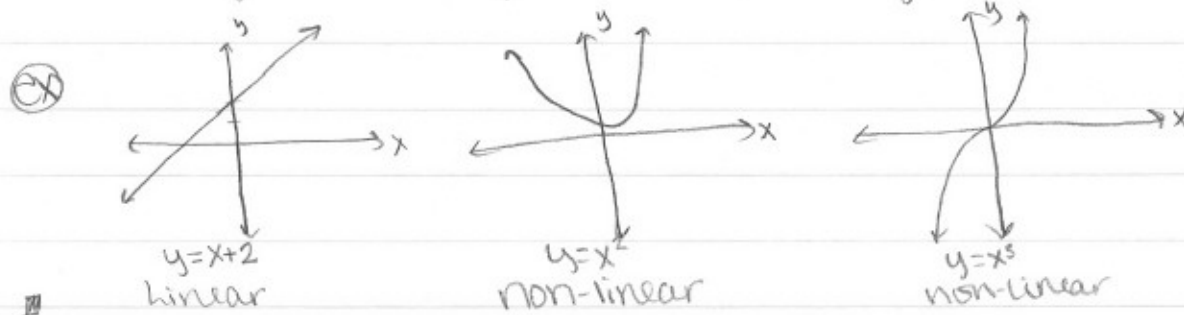


Linear Equations

Linear Equation - equation whose graph is a line.



Standard Form of a Linear Equation

If $A, B,$ and C are real numbers ($A, B \neq 0$)
 $Ax + By = C$

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 $\sqrt{\quad}$, no $||$, etc.

⊗ 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, $A = \frac{1}{4}, B = \frac{9}{210}, C = \frac{1}{3000}$

Solutions of Linear Equations

⊗ For $2x + 6y = 24$

$$2(3) + 6y = 24$$

$$6 + 6y = 24$$

$$6y = 18$$

$$y = 3$$

x	y	(x,y)
3		(3,)
	1	(, 1)

$$2x + 6(1) = 24$$

$$2x + 6 = 24$$

$$2x = 18$$

$$x = 9$$

x	y	(x,y)
3	3	(3,3)
9	1	(9,1)

Graphing Linear Equations

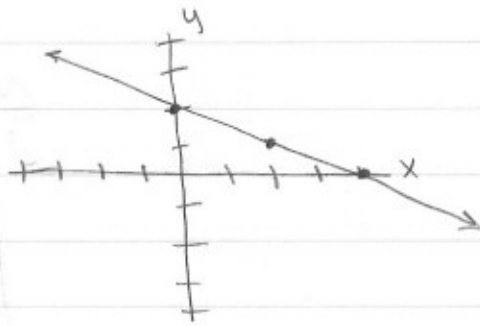
We only need two points to draw a line
(however a 3rd will check.)

Steps to Graphing a Linear equation

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

⊗ $2x + 4y = 8$

x	y
0	2
4	0
2	1



■

might be easier to solve for y first.

⊗ $2x + 4y = 8$

$4y = 8 - 2x$

$y = 2 - \frac{1}{2}x$

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

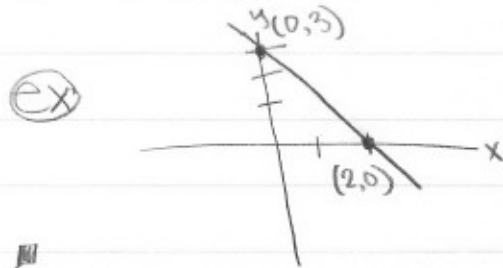
x	y
0	2
2	1
4	0

■

The Intercept Method

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

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



y-intercept is $(0, 3)$

x-intercept is $(2, 0)$

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 $y=0$

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

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

$$y = 2(0) + 3 = 3 \text{ so } y = 3. \rightarrow (0, 3)$$

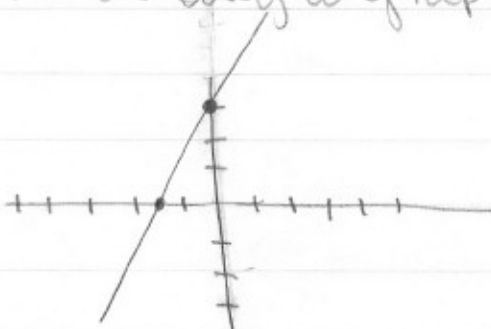
x-intercept: set $y=0$, solve for x

$$0 = 2x + 3$$

$$-3 = 2x$$

$$-\frac{3}{2} = x \rightarrow \text{so } (-\frac{3}{2}, 0)$$

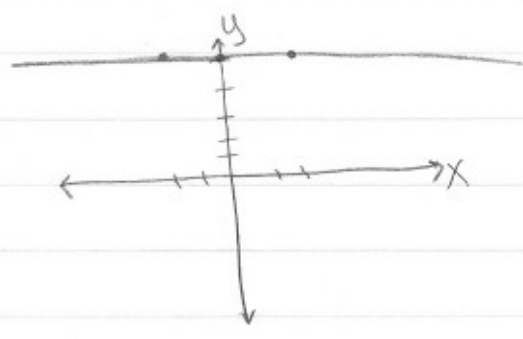
Now it's easy to graph



Graphing Horizontal and Vertical Lines

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

x	y	(x,y)
-2	5	(-2,5)
0	5	(0,5)
2	5	(2,5)



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

x	y	(x,y)
2	-2	(2,-2)
2	0	(2,0)
2	2	(2,2)

