A linear relationship can be written in the standard form **Ax + By + C = 0** and slope y-intercept form **y = mx + b**

Graph: 8x - 4y - 4 = 0

use when $Ax+By+C=0$

METHOD 1: SLOPE and Y-INTERCEPT

Step1: Rearrange the equation in slope y-intercept form as y = mx + b

$8x-4y-4 \quad -8x+4 = 0-8x+4$

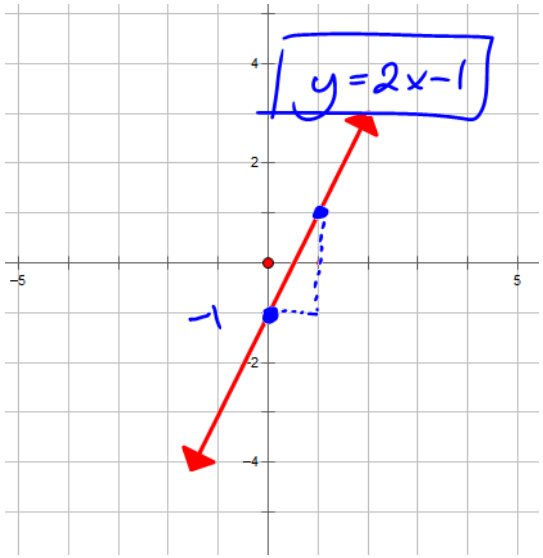
$\frac{-4y}{-4} = \frac{-8x}{-4} + \frac{4}{-4}$

$y = 2x-1$

Step2: Determine the slope (m) and y-intercept (b)

Slope (m) = 2 and y-intercept (b) = -1

Step3: Plot y-int, move right (always) as much as run, then up (if +) / down (if -) as much as rise. Connect the points with an extended line.



$\text{Slope} = \frac{\text{rise}}{\text{run}} = \frac{2}{1}$

METHOD 2: USING X AND Y - INTERCEPTS

Step1: To find the x-intercept, let y = 0 and solve for x.

$8x-4(0)-4 = 0$

$8x-4 \quad +4 = 0 \quad +4$

$\frac{8x}{8} = \frac{4}{8}$

$x = 0.5$

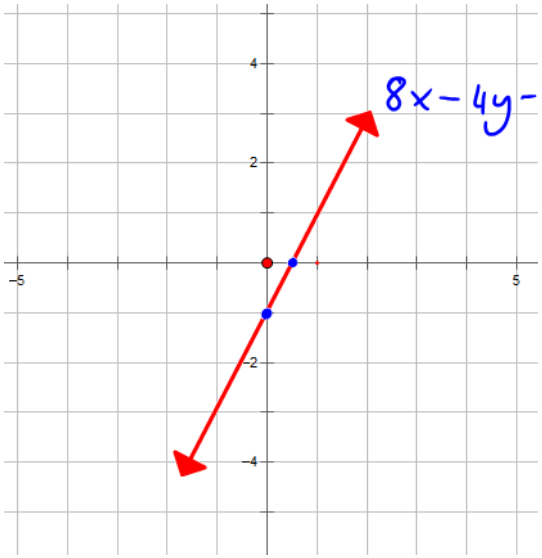
Step2: To find the y-intercept, let x = 0 and solve for y.

$8(0)-4y-4 = 0$

$-4y-4 \quad +4 = 0 \quad +4$

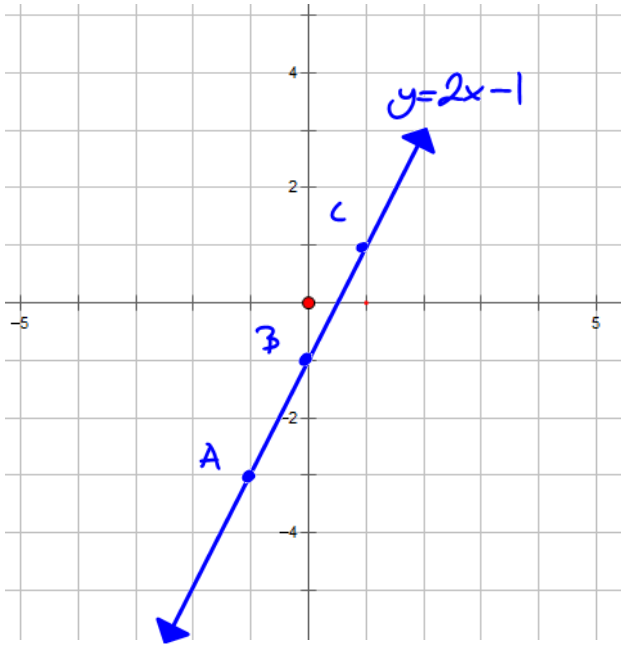
$\frac{-4y}{-4} = \frac{4}{-4}$

$y = -1$



METHOD 3: TABLE OF VALUES (y=mx +b)

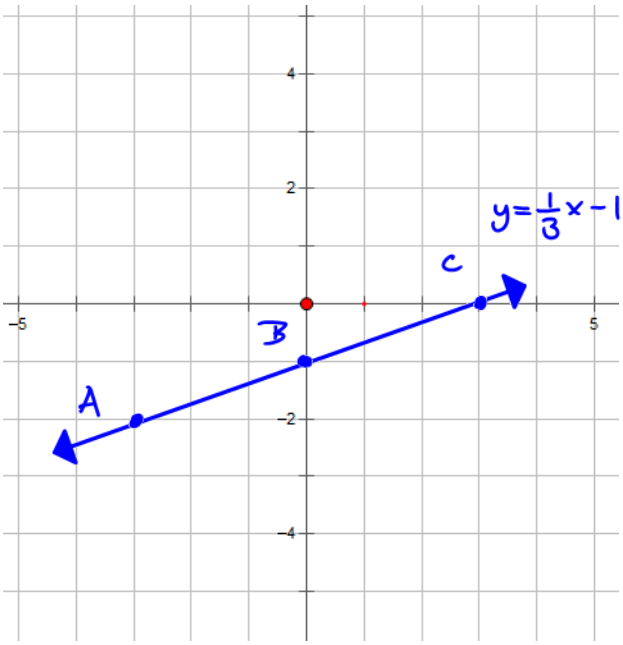
X	Y = $2x-1$	POINTS
-1	$= 2(-1)-1$ $=-2-1$ $=-3$	A(-1,-3)
0	$=2(0)-1$ $=0-1$ $=-1$	B(0,-1)
1	$=2(1)-1$ $=2-1$ $=1$	C(1,1)



Ex2. Graph $y = \frac{1}{3}x - 1$ using a table of values.

use multiples of 3 to avoid decimals

x	$y=\frac{1}{3}x-1$	
-3	$=\frac{1}{3}(-3)-1$ $=-1-1$ $=-2$	A(-3,-2)
0	$=\frac{1}{3}\cdot(0)-1$ $=0-1$ $=-1$	B(0,-1)
3	$=\frac{1}{3}(3)-1$ $=1-1$ $=0$	C(3,0)



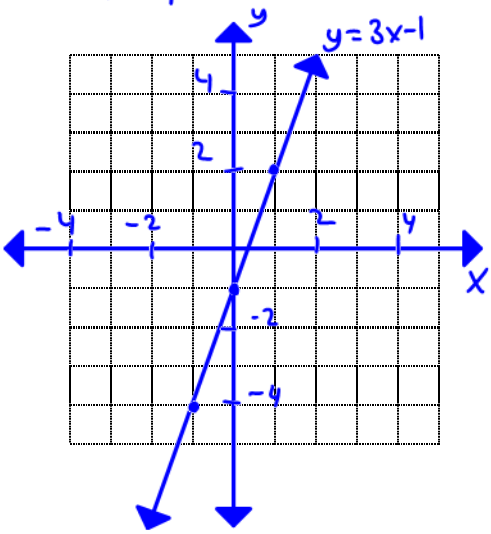
PRACTICE

Graphing

1. Graph each equation using a table of values

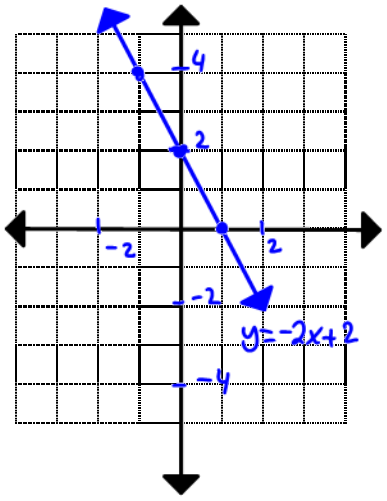
a) $y = 3x - 1$

x	y = 3x − 1	
−1	3(−1) − 1 = −4	(−1, −4)
0	3(0) − 1 = −1	(0, −1)
1	3(1) − 1 = 2	(1, 2)



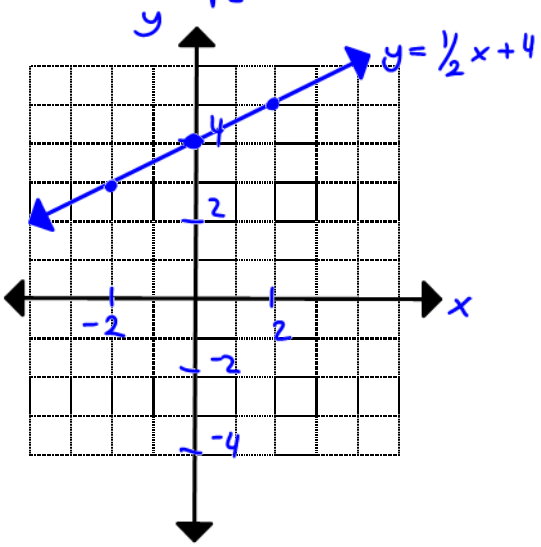
b) $y = -2x + 2$

x	y = −2x + 2	
−1	−2(−1) + 2 = 4	(−1, 4)
0	−2(0) + 2 = 2	(0, 2)
1	−2(1) + 2 = 0	(1, 0)



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

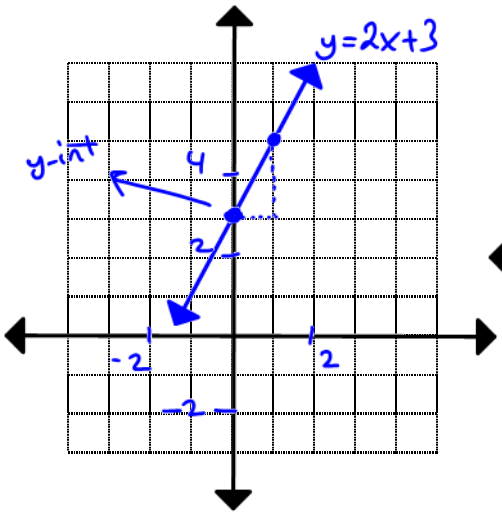
x	$y = \frac{1}{2}x + 4$	
−2	$\frac{1}{2}(-2) + 4 = 3$	
0	$\frac{1}{2}(0) + 4 = 4$	
2	$\frac{1}{2}(2) + 4 = 5$	



2. Graph each equation using the slope and y-intercept.

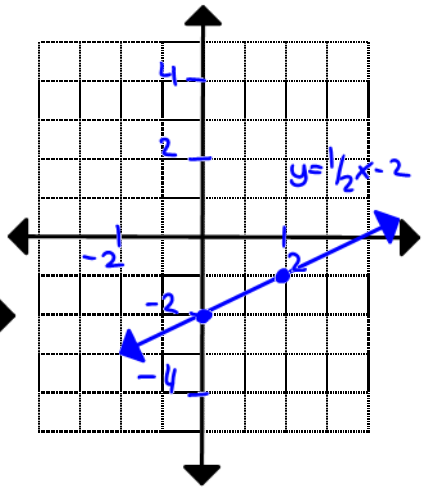
a) $y = 2x + 3$

$m = \frac{rise}{run} = \frac{2}{1}$ y-int = 3



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

$m = \frac{rise}{run} = \frac{1}{2}$ y-int = −2

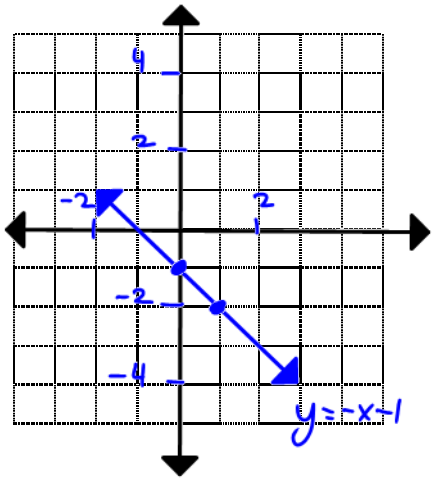


c) $x + y + 1 = 0$

$-x - 1 \quad -x - 1$

$y = -x - 1$

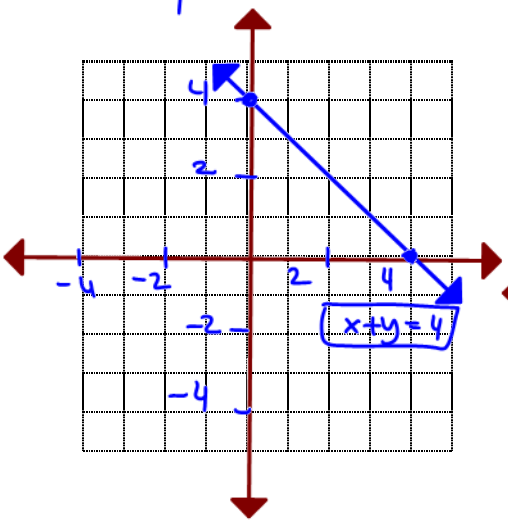
$m = \frac{rise}{run} = -1$ y-int = −1



3. Graph each equation by determining the intercepts.

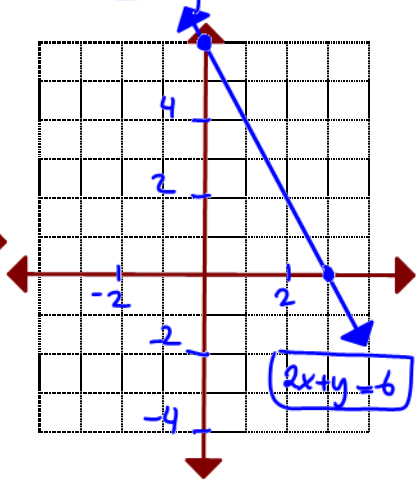
a) $x + y = 4$

x-int $y=0$	y-int $x=0$
$x+0=4$	$0+y=4$
$x=4$	$y=4$



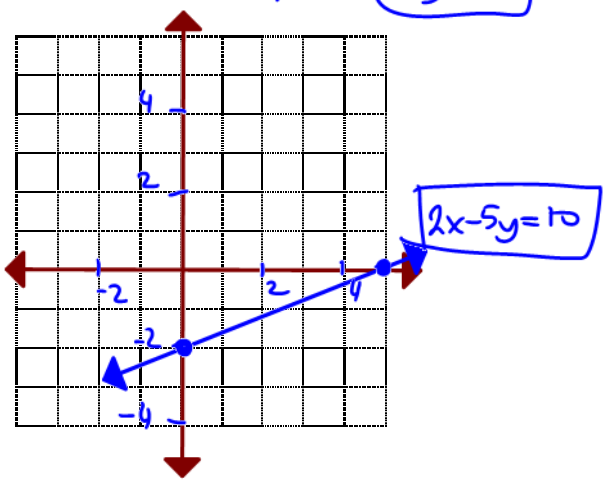
b) $2x + y = 6$

x-int $y=0$	y-int $x=0$
$2x+0=6$	$2(0)+y=6$
$\frac{2x}{2}=\frac{6}{2}$	$y=6$
$x=3$	



c) $2x - 5y = 10$

x-int $y=0$	y-int $x=0$
$2x-5(0)=10$	$2(0)-5y=10$
$\frac{2x}{2}=\frac{10}{2}$	$\frac{-5y}{-5}=\frac{10}{-5}$
$x=5$	$y=-2$

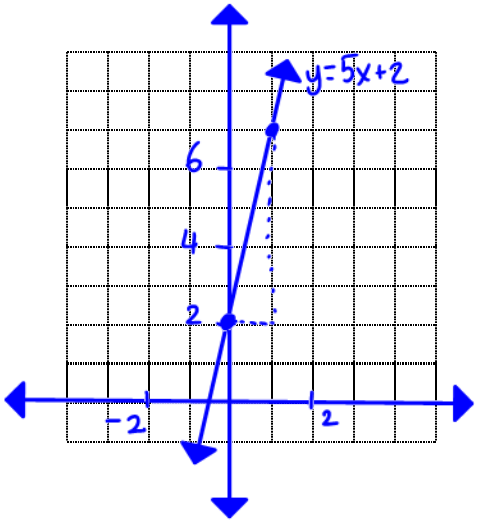


4. Graph each equation using the most suitable method.

a) $y = 5x + 2$

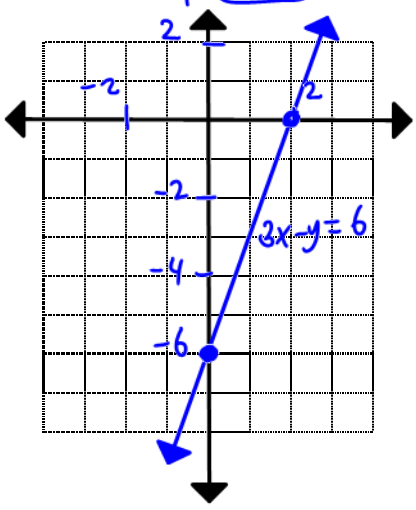
slope $= \frac{\text{rise}}{\text{run}} = \frac{5}{1}$

y-int $= 2$



b) $3x - y = 6$

x-int	y-int
$3x=6$	$\frac{-y}{-1}=\frac{6}{-1}$
$x=2$	$y=-6$



c) $y = 3$

y-int $= 3$

slope $= 0$