Graphing Linear Equations and Functions using a Table of Solutions

Standard Form of a Linear Equation

Both variables are on the left side of the equation with integer coefficients.

In General: $Ax + By = C$

$-3x + y = 10$

$x - 5y = -8$

$x = 3$

$y = -7$

Function Form

Write the equation as a function of x. In other words, solve the equation for y.

In General: $y = mx + b$

$y = -2x + 6$

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

$y = -7$

Write the equation as a function of x. (Solve the equation for y.)

Ex 1: $2x + 5y = 10$

$+(-2x)$ $+(-2x)$

$\frac{5y}{5} = \frac{-2x + 10}{5}$

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

Ex 2: $6x - 4y = 3$

$6x + (-4y) = 3$

$+(-6x)$ $+(-6x)$

$\frac{-4y}{-4} = \frac{-6x + 3}{-4}$

$y = \frac{3}{2}x + \left(-\frac{3}{4}\right)$

Ex 3: $-8x - 6y = 22$

$-8x + (-6y) = 22$

$+8x$ $+8x$

$\frac{-6y}{-6} = \frac{8x + 22}{-6}$

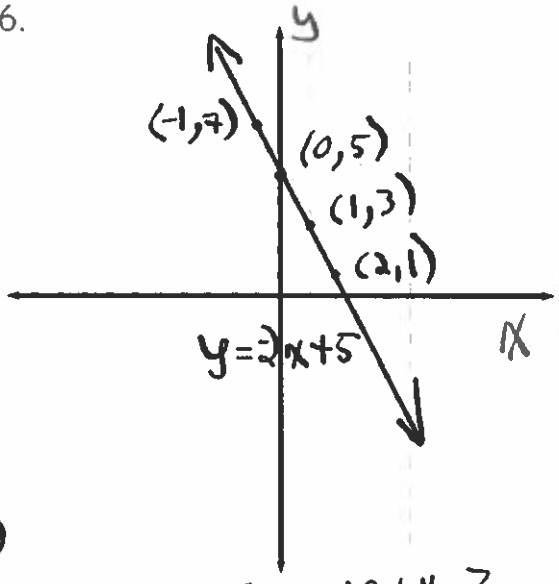
$y = -\frac{4}{3}x + \left(-\frac{11}{3}\right)$

To graph a linear function using a table of solutions, first write the equation as a function of x.

Standard Form	Function of x
$2x+y=5$ $+(-2x)$ $+(-2x)$	$y=-2x+5$

Choose 4 domain values from -6 to 6.

Domain x	Range $y=-2x+5$	Solutions (x,y)
-1	$y=-2(-1)+5$ $y=2+5=7$	(-1,7)
0	$y=-2(0)+5$ $y=5$	(0,5)
1	$y=-2(1)+5$ $y=-2+5=3$	(1,3)
2	$y=-2(2)+5$ $y=-4+5=1$	(2,1)



Domain: $\{x: \text{All Real \#s}\}$

Range: $\{y: \text{All Real \#s}\}$

Standard Form	Function of x
$3x-2y=8$	$y=\frac{3}{2}x+(-4)$

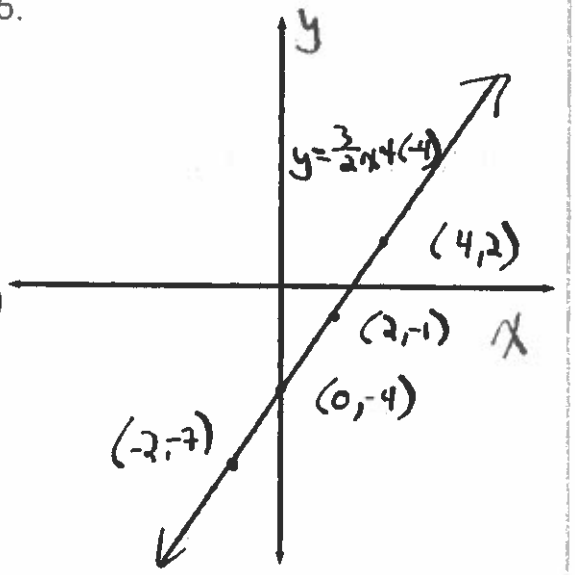
$3x+(-2y)=8$

$+(-3x) \quad +(-3x)$

$\frac{-2y}{-2}=\frac{-3x+8}{-2}$

Choose 4 domain values from -6 to 6.

Domain x	Range $y=\frac{3}{2}x+(-4)$	Solutions (x,y)
-2	$y=\frac{3}{2}(-2)+(-4)$ $y=-3+(-4)=-7$	$(-2,-7)$
0	$y=\frac{3}{2}(0)+(-4)$ $y=0+(-4)=-4$	$(0,-4)$
2	$y=\frac{3}{2}(2)+(-4)$ $y=3+(-4)=-1$	$(2,-1)$
4	$y=\frac{3}{2}(4)+(-4)$ $y=6+(-4)=2$	$(4,2)$



Assignment #15:

Part I: p. 187 #11-19 and p. 219 #2-10 even

Part II: p. 219 #3-17 odd