MTH1W – Unit 6: Coordinate Geometry

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Lesson 6.2: Graphing Linear Relationships

Date: April 14, 2025

Learning Goal: We are learning to create a table of values from a linear equation and use that table to create a list of ordered pairs that can be plotted on a coordinate grid.

$y = 3x + 2$

Once again, we will begin with some new vocabulary:

Independent Variable – It is a variable that does not require dependence or restrictions for its values.

x

Dependent Variable – It is a variable whose values depend on the values of the independent variable.

y

Linear Relationship – It is a relationship between x and y that graphically represents a line.

$y = Ax + B$

Table of Values

(i) If A has no denominator

x	$y = Ax + B$	$P(x, y)$
-2		
-1		
0		
1		
2		

(ii) If A has denominator $\rightarrow A = \frac{N}{D}$

x	$y = Ax + B$	$P(x, y)$
$D(-2)$		
$D(-1)$		
$D(0)$		
$D(1)$		
$D(2)$		

The goal for today's lesson is to graph a linear relationship using this algorithm:

1. **Rearrange the equation so it is dependent variable = everything else (or y=_____)**
2. **Create a Table of Values and choose an appropriate set of x-coordinates.**
3. **Use that set and calculate the corresponding y-coordinates.**
4. **Create the point (x,y).**
5. **Plot the points.**
6. **Draw a line through the points (do not just connect them).**

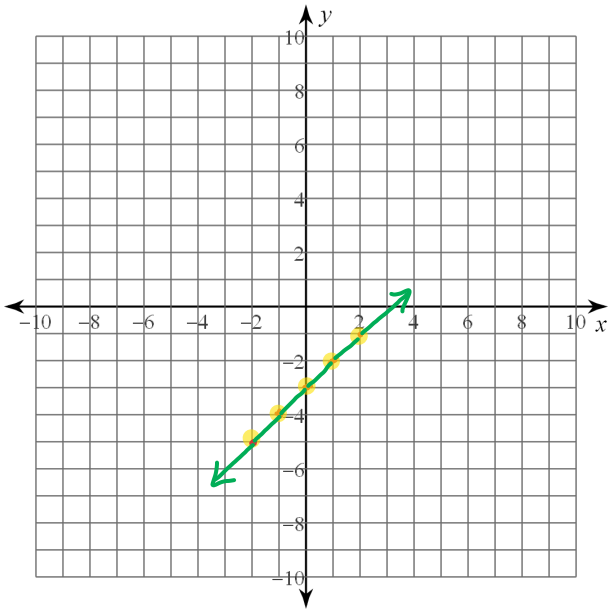
Your table of values should look like this:

x	y	(x,y)
Set of x-coordinates	Corresponding y-coordinates	Set of points to plot

Examples:

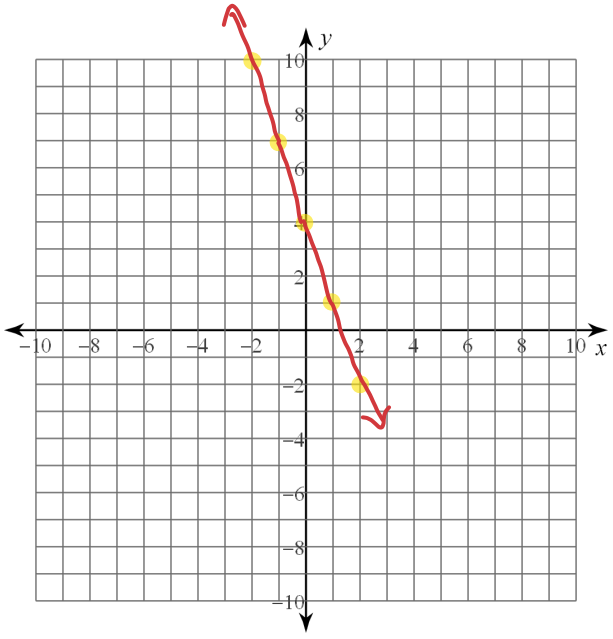
1. $y = x - 3$

x	y	P(x,y)
-2	-2-3=-5	(-2,-5)
-1	-1-3=-4	(-1,-4)
0	0-3=-3	(0,-3)
1	1-3=-2	(1,-2)
2	2-3=-1	(2,-1)



2. $y = -3x + 4$

x	y = -3x + 4	P(x,y)
-2	-3(-2)+4 = 10	(-2,10)
-1	-3(-1)+4 = 7	(-1,7)
0	-3(0)+4 = 4	(0,4)
1	-3(1)+4 = 1	(1,1)
2	-3(2)+4 = -2	(2,-2)



Strategies for converting to y=

1) $y + 3 = x - 5$

$\Rightarrow y = x - 5 - 3$

$\Rightarrow \boxed{y = x - 8}$

2) $3y + 2 = 5x + 1$

$\Rightarrow 3y = 5x + 1 - 2$

$\Rightarrow \frac{3y}{3} = \frac{5x}{3} - \frac{1}{3}$

$\Rightarrow \boxed{y = \frac{5}{3}x - \frac{1}{3}}$

3) $2y = 7(x - 1)$

$\Rightarrow \frac{2y}{2} = \frac{7x}{2} - \frac{7}{2}$

$\Rightarrow \boxed{y = \frac{7}{2}x - \frac{7}{2}}$

Convert each equation into y=

2) $4x + y = -34$

$y = -34 - 4x$

$\boxed{y = -4x - 34}$

$x = (-2, -1, 0, 1, 2)$ ✗

3) $3x + 2y = -20$

$\frac{2y}{2} = \frac{-3x}{2} - \frac{20}{2}$

$\boxed{y = -\frac{3}{2}x - 10}$

$x = (-2, -1, 0, 1, 2)$ ✗

$x = (-4, -2, 0, 2, 4)$

4) $4x - y = 28$

$\frac{-y}{-1} = \frac{-4x}{-1} + \frac{28}{-1}$

$\boxed{y = 4x - 28}$

$x = (-2, -1, 0, 1, 2)$ ✗

5) $5x - 3y = 3$

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

$\boxed{y = \frac{5}{3}x - 1}$

$-2 \quad -1 \quad 0 \quad 1 \quad 2$

$x = (-6, -3, 0, 3, 6)$ ✗