Day 1 Graphing Linear Equations

A Linear equation is an equation that forms a straight line when graphed. We can also say that there is a constant slope or a common difference between the y and x values.

We can graph a linear equation by making a Table and also by using x and y intercepts.

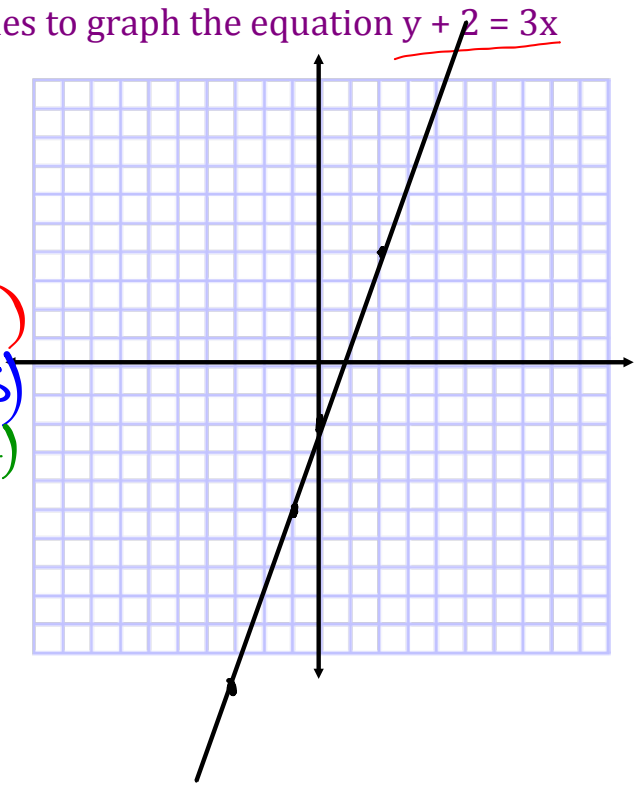
Graphing by a table of values

1. Rewrite the equation in Slope-intercept FORM if necessary
2. Choose values for x that include positive values, zero, and negative values.
3. Substitute the x values to find the corresponding y-value
4. Plot the points from the table of values on a coordinate plane

Example 1 Use a table of values to graph the equation y + 2 = 3x

$y = 3x - 2$

x	y = 3x − 2	y	(x, y)
−6	y = 3(−6) − 2	−20	(−6, −20)
−3	y = 3(−3) − 2	−11	(−3, −11)
−1	y = 3(−1) − 2	−5	(−1, −5)
0	y = 3(0) − 2	−2	(0, −2)
2	y = 3(2) − 2	4	(2, 4)
3			



Graphing by x and y intercepts

The y coordinate where the graph crosses the y-axis is called the y-intercept. This is the y-value where x= 0.

The x coordinate where the graph crosses the x-axis is called the x-intercept. This is the x- value where y= 0.

Finding the intercepts

Example 2: Find the x-intercept and y-intercept of the equation 2x + 3y =6

Remember: x-intercept is where y = 0 and y-intercept is where x = 0

→ x-int (x,0)

$2x+3(0)=6$

$\frac{2x}{2}=\frac{6}{2}$

$x=3$

$\boxed{(3,0)}$

y-int (0,y)

$2(0)+3y=6$

$\frac{3y}{3}=\frac{6}{3}$

$y=2$ ← solution

$\boxed{(0,2)}$ ← intercept

To graph using intercepts:

1. Find the x-intercept by plugging in 0 for y and solve for the x-value
2. Find the y-intercept by plugging in 0 for x and solve for the y-value
3. Plot these points on the coordinate plane

Example 3 Graph 2x+4y=16 by using the x and y intercepts

y-int (0,y)

$2(0)+4y=16$

$\frac{4y}{4}=\frac{16}{4}$

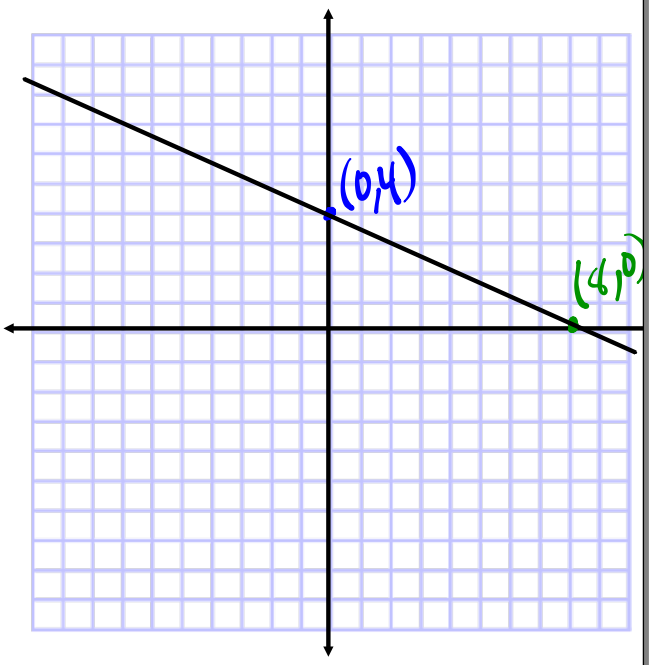
$y=4$ $\boxed{(0,4)}$

x-int (x,0)

$2x+4(0)=16$

$\frac{2x}{2}=\frac{16}{2}$

$x=8$ $\boxed{(8,0)}$



Example 4 Find the x and y intercepts and the slope of the following.

x	y
-4	4
-2	0
0	-4
2	-8

2 -4
2 -4
2 -4

x-intercept: (-2,0)

y-intercept: (0,-4)

slope: $\frac{-4}{2}=-2$

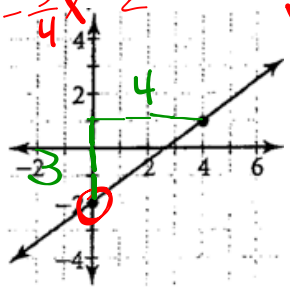
$y=\frac{3}{4}x-2$

$0=\frac{3}{4}x-2$

$2=\frac{3}{4}x$

$8=3x$

$x=\frac{8}{3}$



x-intercept: $(\frac{8}{3},0)$

y-intercept: (0,-2)

slope: $\frac{3}{4}$

Example 5 Find the x and y intercepts of the following and explain what they mean

Position of a Scuba Diver

Time (s)	Position
0	-24
3	-18
6	-12
9	-6
12	0

x-int (x,0)

(12,0)

12 sec scuba diver is at 0

y-int (0,y)

(0,-24)

0 seconds 24 ft under water

Example 6: Graph y = 2 by making a table of values. Name the x and y intercepts

y = 2

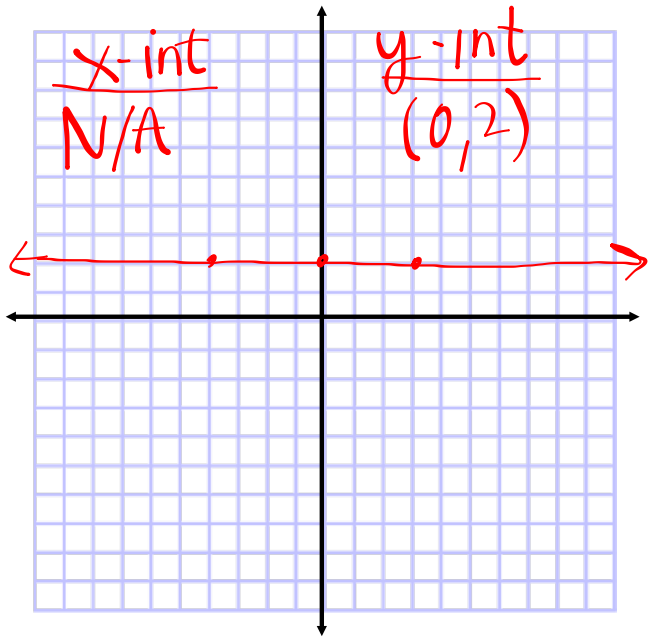
x		y	(x,y)
-4	y=2	2	(-4,2)
0	y=2	2	(0,2)
3	y=2	2	(3,2)

x-int

N/A

y-int

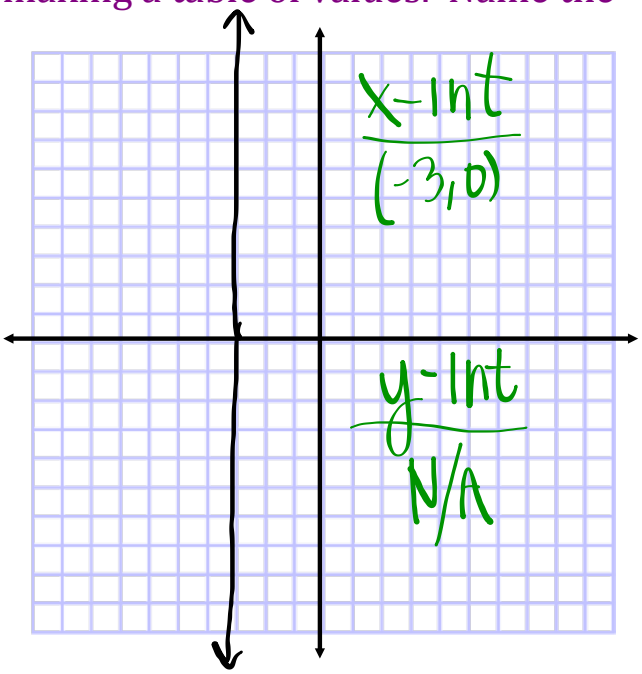
(0,2)



Example 7: Graph x = -3 by making a table of values. Name the x and y intercepts

$x = -3$

x	y	(x,y)
-3	-4	(-3,-4)
-3	0	(-3,0)
-3	2	(-3,2)
-3	3	(-3,3)



Example 7: Graph x = -3 by making a table of values. Name the x and y intercepts