

MATH 45 Summary of Techniques for Graphing A Line

Method 1: Plot x-intercept, Plot y-intercept

Use if both the x-intercept and y-intercept are integers.

To find x-intercept, set $y=0$, solve for x .

To find y-intercept, set $x=0$, solve for y .

Example: $2x + 3y = 6$

x-int: $2x = 6$

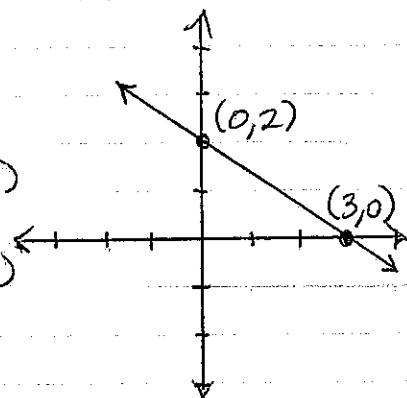
$x = 3 \rightarrow (3, 0)$

y-int: $3y = 6$

$y = 2 \rightarrow (0, 2)$

Use this method if
the constant (6) can be

evenly divided by either coefficient (2 or 3).



Method 2: Plot y-intercept, Use slope

Use if the y-intercept is an integer, but the x-intercept is not.

Write the equation in slope-intercept form ($y = mx + b$).

Example: $2x + 3y = 9$

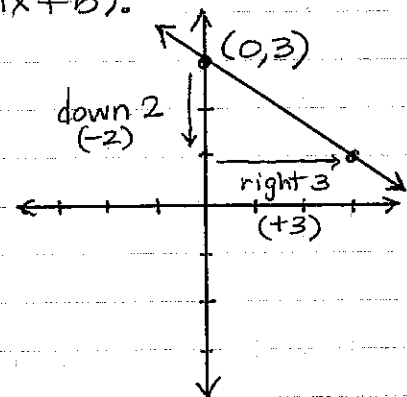
$-2x$

$-2x$

$\frac{3y}{3} = \frac{-2x + 9}{3}$

$y = -\frac{2}{3}x + 3 \rightarrow \text{slope} = -\frac{2}{3}$

y int = (0, 3)



Method 3: Plot x-intercept, Use slope

Use if the x-intercept is an integer, but the y-intercept is not.

To find x-intercept, set $y=0$, solve for x .

Write equation in slope-intercept form ($y = mx + b$).

Example: $2x + 3y = 4$

x-int: $2x = 4$

$x = 2 \rightarrow (2, 0)$

$2x + 3y = 4$

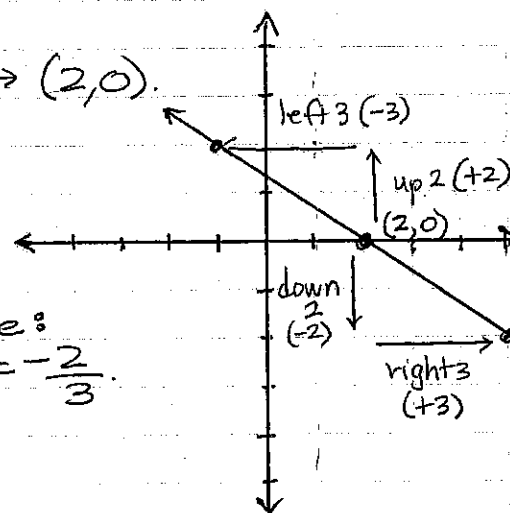
$-2x$

$-2x$

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

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

$\rightarrow \text{slope: } m = -\frac{2}{3}$



Method 4: Plot any point, use slope

Use if neither the x-intercept nor the y-intercept is an integer.

Write the equation in slope-intercept form ($y = mx + b$).

Make a chart:

x	y
1	
2	
3	

Stop work on the chart when you find one point (x,y) where both coordinates are integers.

Example: $2x + 3y = 7$

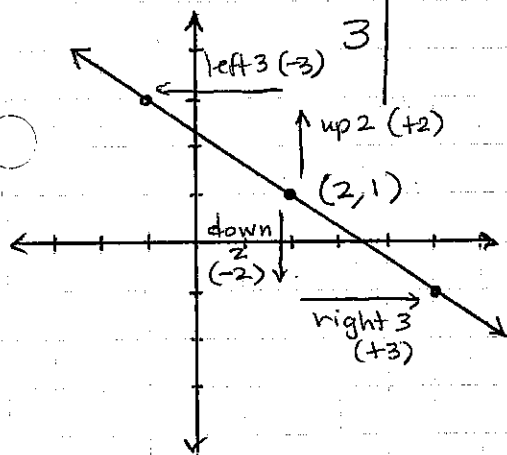
$-2x$

$-2x$

$$\frac{3y}{3} = \frac{-2x + 7}{3}$$

$$y = \frac{-2x + 7}{3} \rightarrow \text{slope } m = -\frac{2}{3}$$

x	y
1	$\frac{5}{3}$
2	1
3	$\frac{1}{3}$



$$x=1: \begin{array}{r} 2(1) + 3y = 7 \\ -2 \quad -2 \end{array}$$

$$\frac{3y}{3} = \frac{5}{3}$$

$$y = \frac{5}{3} \quad \text{keep going.}$$

$$x=2: \begin{array}{r} 2(2) + 3y = 7 \\ -4 \quad -4 \end{array}$$

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

$$y = 1 \quad \text{stop.}$$

Method 5: Plot any two points

Use if neither the x-intercept nor the y-intercept is an integer.

Make a chart

x	y
1	
2	
3	

Stop work on the chart when you find two points (x,y) where both coordinates are integers.

Example: $2x + 3y = 7$

x	y
1	$\frac{5}{3}$
2	1 $\rightarrow (2, 1)$
3	$\frac{1}{3}$
4	$-\frac{1}{3}$
5	-1 $\rightarrow (5, -1)$

