Graphing Linear Equations

We know from geometry that through two points one and only one straight line can be drawn. Using this fact, it is enough for us to find two points and once we plot them we draw the straight line joining them.

A simple method of graphing a linear equation is using the points where the line crosses the *x*-axis and the *y*-axis. Consider the equations *x* -5*y* = 10.

To find the x-intercept, let y=0.

$x - 5y = 10$

$x - 5(0) = 10$ Therefore, the x-intercepts is $(10,0)$
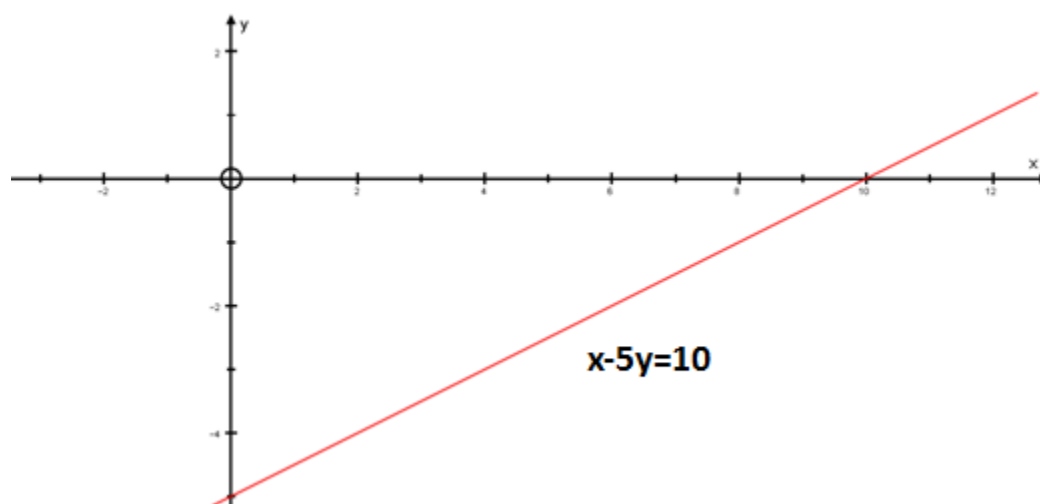
$x - 0 = 10$

$x = 10$

To find the y-intercept, let x=0.

$x - 5y = 10$

$0 - 5y = 10$ Therefore, the y-intercepts is $(0,-2)$

$-5y = 10$

$y = -2$

This means that the graph intersects the *x*-axis at (10, 0) and the *y*-axis at (0, -2). Graph these ordered pairs. Then draw the line that passes through these points.

x-5y=10

Rule 1: To graph a linear equation we follow the steps below:
Step 1: Find the *x*- and *y*- intercepts using the table below:

x	0	
y		0

Step 2: Plot the intercepts
Step 3: Draw the straight line joining the two points.

Example 1 : Graph the linear function by finding the *x*- and *y*- intercepts.

$y = 12 - 3x$

$x - \text{int}ercept \Rightarrow y = 0 \Rightarrow 0 = 12 - 3x \Rightarrow 3x = 12 \Rightarrow x = 4$ $\qquad (4,0)$

$y - \text{int}ercept \Rightarrow x = 0 \Rightarrow y = 12 - 3(0) = 12 - 0 = 12 \Rightarrow y = 12$ $\quad (0,12)$

x	0	4
y	12	0

Now we plot the two points $(4,0)$ and $(0,12)$