

## MFM2P – Equations of Lines – Day 6: x-Intercepts and y-Intercepts

The **y-intercept** of a line is the point where the line crosses the Y axis, and where X = 0.

The **x-intercept** of a line is the point where the line crosses the X axis, and where Y = 0.

### Finding the x-intercept and y-intercept of a line in slope y-intercept form

$$y = 3x - 6$$

Determining the y-intercept:

$$\begin{aligned} y &= 3(0) - 6 \\ y &= 0 - 6 \\ \boxed{y = 6} &\rightarrow (0, 6) \end{aligned}$$

Determining the x-intercept

$$\begin{aligned} 0 &= 3x - 6 \\ +6 &\quad +6 \\ 3x &= 6 \\ \frac{3}{3} &\quad \frac{6}{3} \\ \boxed{x = 2} &\rightarrow (2, 0) \end{aligned}$$

### Finding the x-intercept and y-intercept of a line in standard form

$$2x + 3y - 6 = 0$$

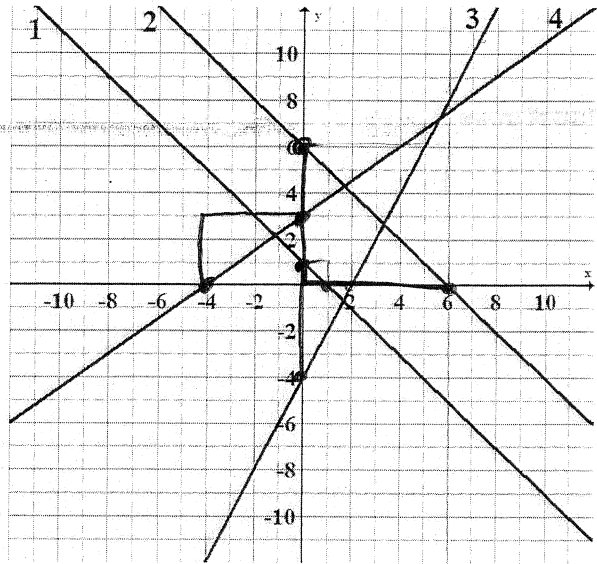
Determining the y-intercept:

$$\begin{aligned} 2(0) + 3y - 6 &= 0 \\ +6 &\quad +6 \\ 3y &= 6 \\ \frac{3}{3} &\quad \frac{6}{3} \\ \boxed{y = 2} &\rightarrow (0, 2) \end{aligned}$$

Determining the x-intercept

$$\begin{aligned} 2x + 3(0) - 6 &= 0 \\ +6 &\quad +6 \\ 2x &= 6 \\ \frac{2}{2} &\quad \frac{6}{2} \\ \boxed{x = 3} &\rightarrow (3, 0) \end{aligned}$$

Line	x-intercept	y-intercept
1	(1, 0)	(0, 1)
2	(6, 0)	(0, 6)
3	(2, 0)	(0, -4)
4	(-4, 0)	(0, 3)



Use the graph and table above to determine the equation of each line.

Equation for line #1 $y = -x + 1$	Equation for line #2 $y = -x + 6$
Equation for line #3 $y = 2x - 4$	Equation for line #4 $y = \frac{3}{4}x + 3$

Calculate the x- and y-intercepts and graph each line on the grid below.

1.  $3x - y + 9 = 0$

<u>x-int</u>	<u>y-int</u>
$3x + 9 = 0$	$-y + 9 = 0$
$-9 - 9$	$-9 - 9$
$3x = -9$	$-y = -9$
$\frac{3x}{3} = \frac{-9}{3}$	$\frac{-y}{-1} = \frac{-9}{-1}$
$x = -3$	$y = 9$

2.  $-4x - 7y + 28 = 0$

<u>x-int</u>	<u>y-int</u>
$-4x + 28 = 0$	$-7y + 28 = 0$
$-28 - 28$	$-28 - 28$
$-4x = -28$	$-7y = -28$
$\frac{-4x}{-4} = \frac{-28}{-4}$	$\frac{-7y}{-7} = \frac{-28}{-7}$
$x = 7$	$y = 4$

3.  $8x - 5y - 40 = 0$

<u>x-int</u>	<u>y-int</u>
$8x - 40 = 0$	$-5y - 40 = 0$
$+40 + 40$	$+40 + 40$
$8x = 40$	$-5y = 40$
$\frac{8x}{8} = \frac{40}{8}$	$\frac{-5y}{-5} = \frac{40}{-5}$
$x = 5$	$y = -8$

4.  $-2x - 3y - 12 = 0$

<u>x-int</u>	<u>y-int</u>
$-2x - 12 = 0$	$-3y = 12 = 0$
$+12 + 12$	$+12 + 12$
$-2x = 12$	$-3y = 12$
$\frac{-2x}{-2} = \frac{12}{-2}$	$\frac{-3y}{-3} = \frac{12}{-3}$
$x = -6$	$y = -4$

