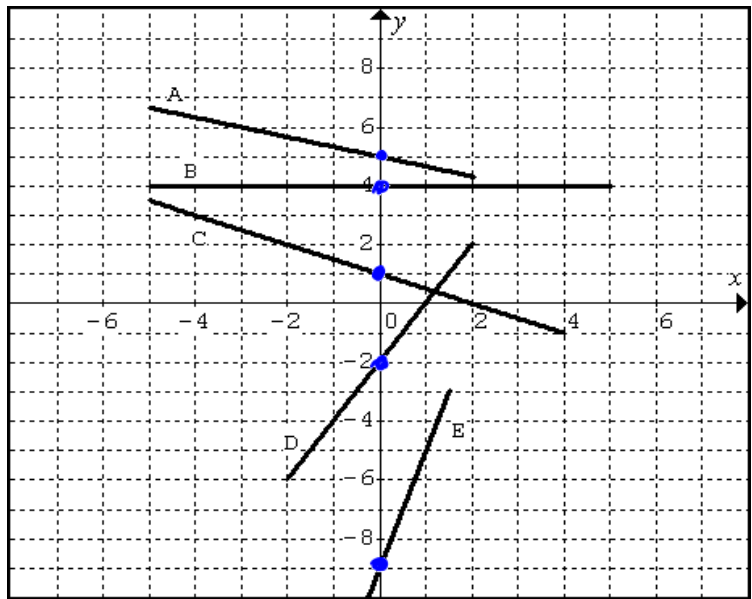
DEFINITION: The y-intercept is the point on the y-axis where your line crosses or meets the y-axis. It is also the coordinate that has an x-value of ZERO. (0, y)

For each line on the grid to the right, state the COORDINATE of the y-intercept. Line A is done for you.

A) (0 , 5)

B) (0 , 4)

C) (0 , 1)

D) (0 , -2)

E) (0 , -9)

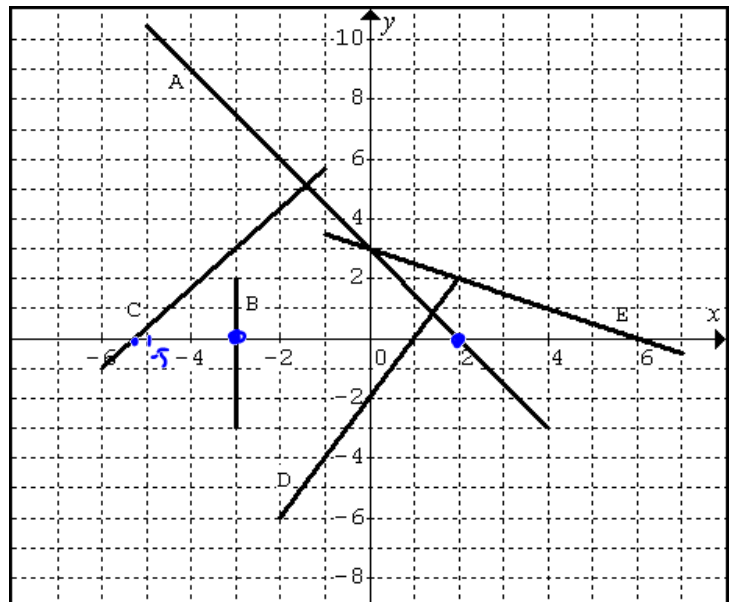What do all these points have in common?

x - values   are   "0"

DEFINITION: The x-intercept is the point on the x-axis where your line crosses or meets the x-axis. It is also the coordinate that has a y-value of ZERO. (x, 0)

For each line on the grid to the right, state the COORDINATE of the x-intercept. Line A is done for you. *

A) (2 , 0)

B) (-3 , 0)

C) (-5.2 , 0)

D) (1 , 0)

E) (6 , 0)

What do all these points have in common?

y values equal "0"

Lesson: Graphing with x-Intercepts and y-Intercepts

- Note problems where you are asked to find both the intercepts, the line is usually not in y=mx+b form, rather a different form (possibly standard form Ax + By + C = 0).

QUESTION 1: PART A
Given the equation 3x + 4y = 12 what are the intercepts of this line.

SOLUTION
To find the y-intercept, the x-value must be 0.
1. Substitute x=0
2. Solve the equation for y

$$3(0) + 4y = 12$$
$$\frac{4y}{4} = \frac{12}{4}$$
$$\boxed{x=0} \quad \boxed{y=3}$$

The y-intercept is (0 , 3)

To find the x-intercept, the y-value must be 0.
1. Substitute y=0
2. Solve the equation for y

$$3x + 4(0) = 12$$
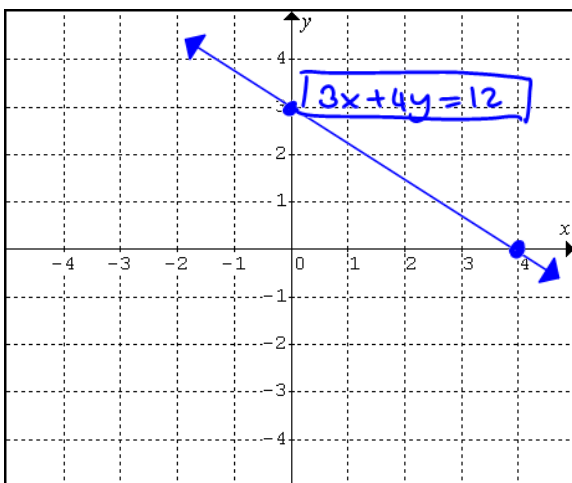$$\frac{3x}{3} = \frac{12}{3}$$
$$\boxed{x = 4} \quad \boxed{y = 0}$$

The x-intercept is (4 , 0)

QUESTION 1: PART B
Graph the line 3x + 4y = 12 using the intercepts.

Plot the coordinates of each intercept and connect the two points to create your line.

3x+4y=12.

QUESTION 2 : PART A
12
Given the equation -6x + 12y – 24 = 0 what are the intercepts of this line.

SOLUTION
To find the y-intercept, the x-value must be 0.
1. Substitute x=0
2. Solve the equation for y

$$-6(0) + 12y - 24 = 0$$
$$\frac{12y}{12} = \frac{24}{12}$$
$$\boxed{x=0} \quad \boxed{y=2}$$

The y-intercept is (0 , 2)

To find the x-intercept, the y-value must be 0.
1. Substitute y=0
2. Solve the equation for y

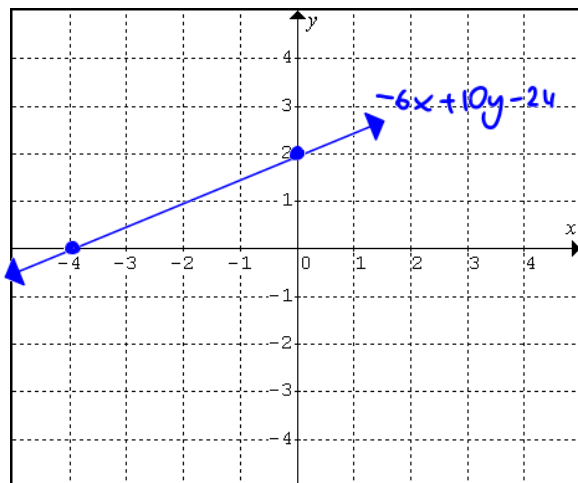$$-6x + 12(0) - 24 = 0$$
$$\frac{-6x}{-6} = \frac{24}{-6}$$
$$\boxed{x = -4}$$

The x-intercept is (-4 , 0)

QUESTION 2 : PART B
Graph the line -6x + 12y – 24 = 0 using the intercepts.   **12**

Plot the coordinates of each intercept and connect the two points to create your line.

-6x+10y-24

Practice: Graphing with x-Intercepts and y-Intercepts

a. $4x - y = 8$

x-intercept: $y = 0$
$4x = 8$
$x = 2$

$(\underline{2}, \underline{0})$

y-intercept: $x = 0$
$4(0) - y = 8$
$y = -8$

$(\underline{0}, \underline{-8})$

4x - y = 8 (graph, line plotted)

b. $7x - 9y = 63$

x-intercept: $y = 0$
$7x - 9(0) = 63$
$x = 9$

$(\underline{9}, \underline{0})$

y-intercept: $x = 0$
$7(0) - 9y = 63$
$y = -7$

$(\underline{0}, \underline{-7})$

7x - 9y = 63 (graph, line plotted)

c. $x + 2y = 5$

x-intercept: $y = 0$
$x + 0 = 5$
$x = 5$

$(\underline{5}, \underline{0})$

y-intercept: $x = 0$
$0 + 2y = 5$
$y = 2.5$

$(\underline{0}, \underline{2.5})$

x + 2y = 5 (graph, line plotted)

d. $2x - 5y = -4$

x-intercept: $y = 0$
$2x = -4$
$x = -2$

$(\underline{-2}, \underline{0})$

y-intercept: $x = 0$
$-5y = -4$
$\boxed{y = 0.8}$

$(\underline{0}, \underline{0.8})$

2x - 5y = -4 (graph, line plotted)

e. $3x + 4y - 8 = 0$

x-intercept: $y = 0$
$3x - 8 = 0$
$\dfrac{3x}{3} = \dfrac{8}{3} \Rightarrow \boxed{x = 8/3}$
$x = 2\tfrac{1}{3}$

$(\underline{8/3}, \underline{0})$

y-intercept: $x = 0$
$4y = 8$
$y = 2$

$(\underline{0}, \underline{2})$

3x + 4y - 8 = 0 (graph, line plotted)

f. $4x - y = 9$

x-intercept: $y = 0$
$4x = 9$
$x = 9/4$

$(\underline{9/4}, \underline{0})$

y-intercept: $x = 0$
$y = -9$

$(\underline{0}, \underline{-9})$

4x - y = 9 (graph, line plotted)

ANSWERS: a. (2, 0) (0, -8)   b. (9, 0), (0, -7)   c. (5, 0), (0, 2.5)   d. (-2, 0), (0, 0.8),   e. ($\frac{8}{3}$, 0) (0, 2)   f. ($\frac{9}{4}$, 0) (0, -9)