

Date: _____

5.2 General Form

General Form: The equation of a line in the form
 $Ax + By + C = 0$ where $A \in \mathbb{W}$ and $B, C \in \mathbb{I}$
 * one of A or B could be 0 but not both

Ex. Rewrite each equation in general form:

$3(y) = (-\frac{2}{3}x) + 6$ * multiply all terms by the LCD

$$3y = -2x + 18$$

$$2x + 3y - 18 = 0$$

$$0 = -2x - 3y + 18$$

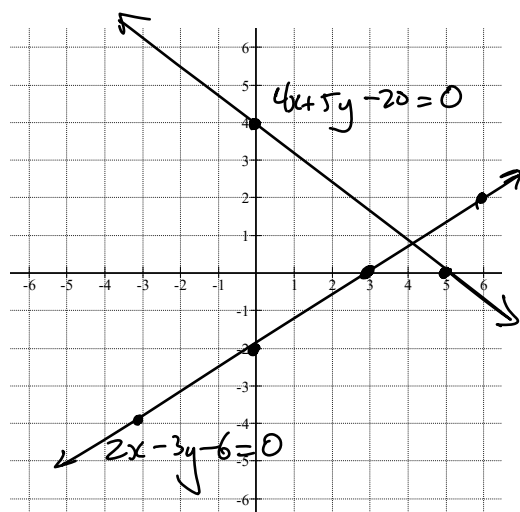
$$0 = 2x + 3y - 18$$

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

$$4y = \frac{3}{4}x - 8$$

$$3x - 4y - 8 = 0$$

Ex. For each linear equation determine the x-intercept, determine the y-intercept, and graph the line using the intercepts:



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

x-int
 let $y = 0$
 $2x - 3(0) - 6 = 0$
 $2x - 6 = 0$
 $2x = 6$
 $x = 3$

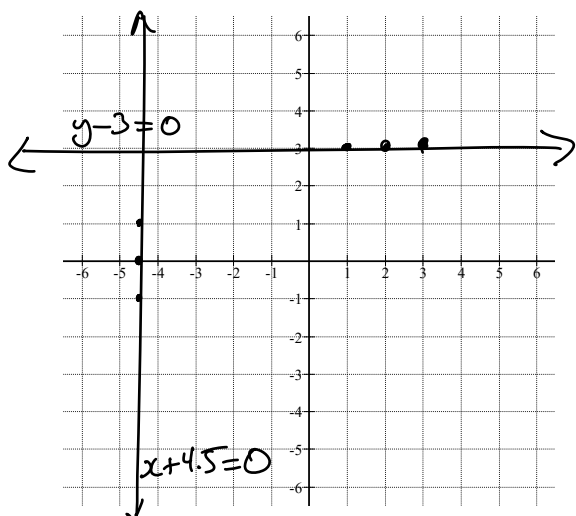
y-int
 let $x = 0$
 $2(0) - 3y - 6 = 0$
 $-3y - 6 = 0$
 $-3y = 6$
 $y = -2$

$$4x + 5y - 20 = 0$$

x-int
 $4x + 5(0) - 20 = 0$
 $4x - 20 = 0$
 $4x = 20$
 $x = 5$

y-int
 $4(0) + 5y - 20 = 0$
 $5y - 20 = 0$
 $5y = 20$
 $y = 4$

Ex. Sketch each linear relation and identify the intercepts. Then state the domain & range.



$$y - 3 = 0$$

$$y = 3 \leftarrow \text{horizontal line}$$

x	y
1	3
2	3
3	3
7	3
-80	3

x-int: none
y-int = 3

$D: \{x \mid x \in \mathbb{R}\}$
 $R: \{y \mid y = 3, y \in \mathbb{N}\}$

$$x + 4.5 = 0$$

$$x = -4.5 \leftarrow \text{vertical line}$$

x-int = -4.5
y-int: none

$D: \{x \mid x = -4.5, x \in \mathbb{Q}\}$
 $R: \{y \mid y \in \mathbb{R}\}$

Ex. Spencer has 66 GB of disk space left on his laptop to fill with television shows and movies that he purchases on-line.

- a. Suppose a one-hour show uses 1.1 GB of disk space and a movie uses 4.4 GB. Write a linear equation that represents the number of television shows, T, and movies, M, that Spencer can store on his laptop.

$$1.1T + 4.4M = 66 \leftarrow$$

$$\rightarrow (4.4M) + (1.1T) - (66) = (0) \rightarrow$$

$$44M + 11T - 660 = 0 \leftarrow$$

- b. Determine the T-intercept of a graph of the linear equation. What does the T-intercept represent?

let $M = 0$

$$44(0) + 11T - 660 = 0 \quad \text{He could store 60 TV shows but no movies.}$$

$$11T = 660$$

$$T = 60$$

- c. What would the M-intercept be? What does the M-intercept represent?

let $T = 0$

$$44M + 11(0) - 660 = 0 \quad \text{He could store 15 movies but no TV shows.}$$

$$44M = 660$$

$$M = 15$$

- d. If Spencer stores 16 television shows, how many movies does he have space for?

$T = 16$

$$44M + 11(16) - 660 = 0$$

$$44M + 176 - 660 = 0$$

$$44M - 484 = 0$$

$$44M = 484$$

$$M = 11 \text{ movies}$$