

Lesson 6: X- and Y- Intercepts

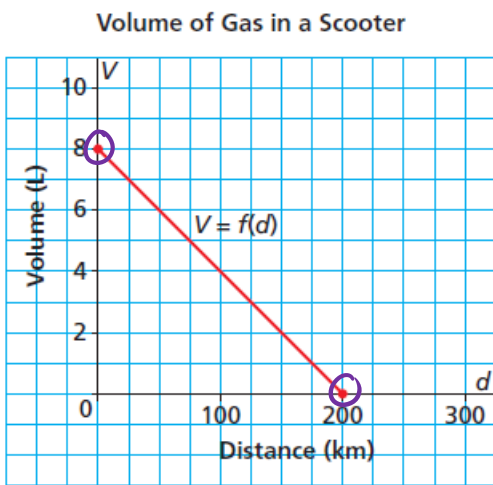
Intercepts of Linear Functions

The x-coordinate of the point where a graph intersects the x-axis is called the x-intercept (or horizontal intercept). At this point, $y = 0$ or $f(x) = 0$.

The y-coordinate of the point where a graph intersects the y-axis is called the y-intercept (or vertical intercept). At this point, $x = 0$.

We can determine these points by analyzing the graph of a function:

Example: This graph shows the fuel consumption of a scooter with a full tank of gas at the beginning of a journey.



- a) Write the coordinates of the points where the graph intersects the axes.

$(0, 8)$ y-int.

$(200, 0)$ x-int

- b) Determine the vertical and horizontal intercepts. Describe what the points of intersection represent.

vertical: volume of tank (8L) when distance is 0 km.

horizontal: Distance travelled (200 km) until volume of gas is 0L

- c) What are the domain and range of this function?

$D: 0 \leq d \leq 200$ $R: 0 \leq v \leq 8$

We can also determine the x and y intercepts of a function by substituting into the equation.

Examples:

- a) Determine the x and y intercepts of the function $f(x) = 2x - 4$ then graph it.

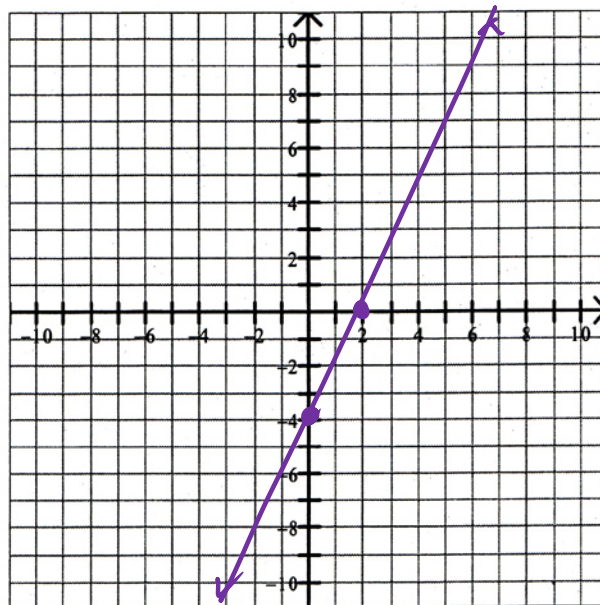
x	y
0	-4
2	0

$$y = 2(0) - 4$$

$$y = 0 - 4 = -4$$

$$0 = 2x - 4$$

$$\frac{4}{2} = \frac{2x}{2} \quad x = 2$$



b) Determine the x and y intercepts of the function $f(x) = -2x + 7$ then graph it.

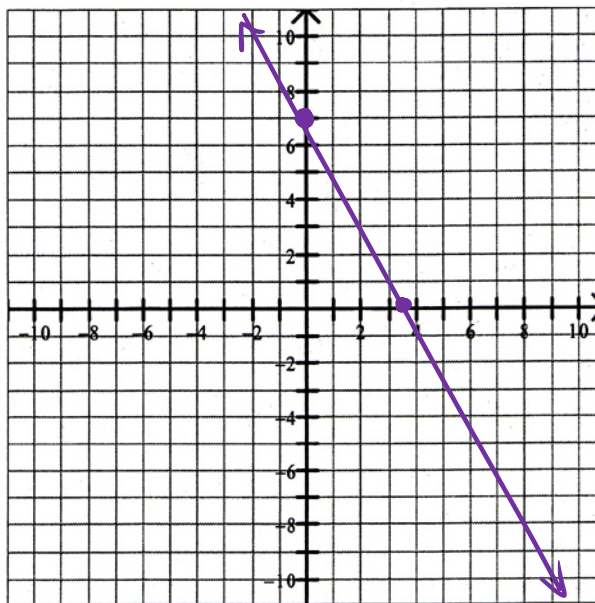
x	y
0	7
$\frac{7}{2}$	0

$$y = -2(0) + 7$$

$$y = 7$$

$$0 = -2x + 7$$

$$\frac{-7}{-2} = \frac{-2x}{-2} \quad x = \frac{7}{2}$$



c) Determine the x and y intercepts of the function $f(x) = 4x - 3$ then graph it.

x	y
0	-3
$\frac{3}{4}$	0

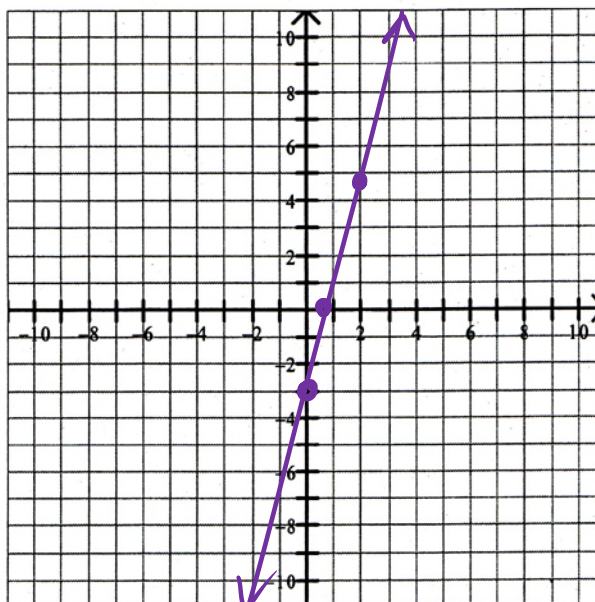
$$y = 4(0) - 3$$

$$y = 0 - 3 = -3$$

$$0 = 4x - 3$$

$$3 = 4x$$

$$x = \frac{3}{4} \quad (0.75)$$



$$y = 4(2) - 3$$

$$y = 8 - 3 = 5 \quad (2, 5)$$

page 319 #4-7,9,12,16

#6,