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Standard Form

Unit 5 Lesson 5

STANDARD FORM

Students will be able to:

Understand the standard form of linear equations
and use it to graph these linear equations

Key Vocabulary:

- Standard Form
- X-intercept
- Y-intercept

STANDARD FORM

Standard Form

The standard form of a linear equation is given by:

$$ax + by = c$$

Where:

- $a, b, c \in \mathbf{R}$
- a and b are not both zero

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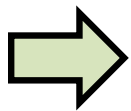
Intercepts in the linear equation

We can find the x-intercept and y-intercept of the graph of a linear equation by putting $x = 0$ or $y = 0$. (depending on the intercept to be found)

$$ax + by = c$$

- For finding **x-intercept**, put $y = 0$ in the standard form.

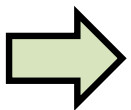
$$ax + b(0) = c$$



$$x = \frac{c}{a}$$

- For finding **y-intercept**, put $x = 0$ in the standard form.

$$a(0) + by = c$$



$$y = \frac{c}{b}$$

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Problem 1: What are the x- and y-intercepts of the graph $4x - 12y = 24$?

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Problem 1: What are the x - and y -intercepts of the graph $4x - 12y = 24$?

- For finding **x -intercept**, put $y = 0$ in the standard form.

$$4x - 12(0) = 24 \quad \Rightarrow \quad x = \frac{24}{4}$$

$$\Rightarrow \quad x = 6$$

- For finding **y -intercept**, put $x = 0$ in the standard form.

$$4(0) - 12y = 24 \quad \Rightarrow \quad y = \frac{24}{12}$$

$$\Rightarrow \quad y = 2$$

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Graphing Linear Equations in Standard Form

If we are given linear equations in standard form, we can graph it by finding the x-intercept and y-intercept.

- **(0,y-intercept)** is the point on the y-axis
- **(x-intercept, 0)** is the point on the x-axis

Connect these two points to graph the linear equation.

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Problem 2: Graph the equation $2x - y = 1$.

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Problem 2: Graph the equation $2x - y = 2$.

- For finding **x-intercept**, put $y = 0$ in the standard form.

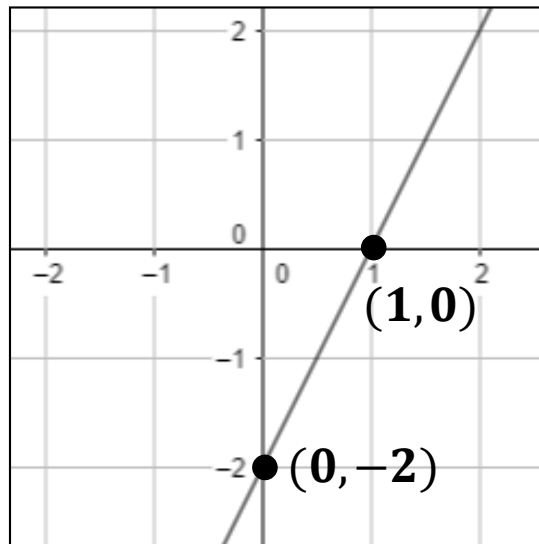
$$2x - (0) = 2 \quad \Rightarrow \quad x = \frac{2}{2}$$

$$\Rightarrow \quad x = 1 \quad \Rightarrow \quad (1, 0)$$

- For finding **y-intercept**, put $x = 0$ in the standard form.

$$2(0) - y = 2 \quad \Rightarrow \quad y = -2$$

$$\Rightarrow \quad (0, -2)$$



$$2x - y = 2$$