

Lesson 4.5 Graphing Linear Equations In Standard Form

Learning Targets:

- Recognize an Equation in Standard Form
- Identify the x and y -intercepts
- Use the intercepts to graph the line

Learning Target #1

Recognizing Equations in Standard Form



Forms of Linear Equations

Direct Variation	Slope-Intercept	Standard Form
$y = mx$ (y=kx)	$y = mx + b$	$ax + by = c$ $4x + 2y = 16$

Standard Form

$$ax + by = c$$

$$-3x + 7y = 21$$

Standard Form

YES !

$$\boxed{ax + by = c}$$

$$6x + 3y = 18$$

$$12x + 4y = -24$$

$$-5x + 2y = 10$$

$$9x - 4y = 36$$

NOT !

$$y = 2x - 5$$

$$y = -3x + 4$$

$$y = \frac{2}{3}x - 2$$

$$y = 4x$$

$$y = \frac{2}{3}x$$

Identify the Equations in Standard Form

Match each Equation with its correct form

a	$3x + 6y = 18$	Direct Variation	Slope-Intercept	Standard Form
b	$y = \frac{2}{3}x - 6$	Direct Variation	Slope-Intercept	Standard Form
c	$-5x + 9y = 27$	Direct Variation	Slope-Intercept	Standard Form
d	$y = 9x$	Direct Variation	Slope-Intercept	Standard Form
e	$\frac{3}{4}x - 12y = 36$	Direct Variation	Slope-Intercept	Standard Form
f	$8x + 2y = -24$	Direct Variation	Slope-Intercept	Standard Form

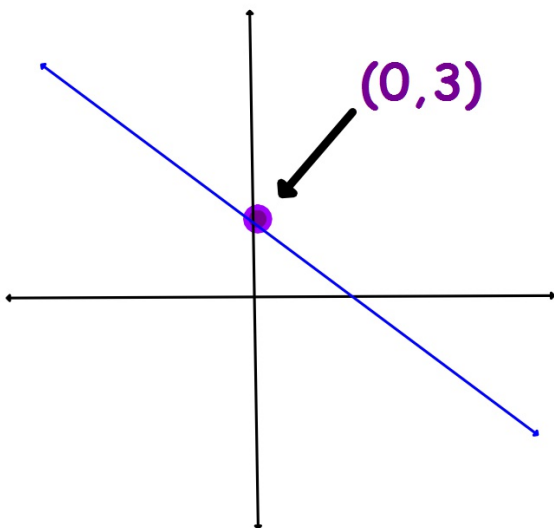
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Learning Target #2

Identify the x and y-intercepts

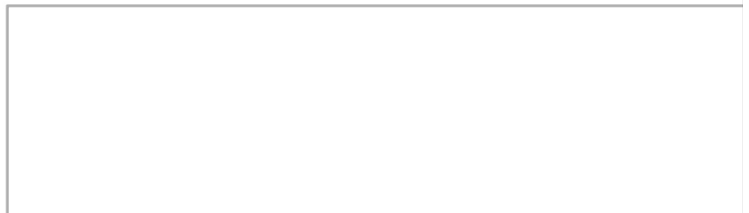


Important Vocabulary: y -intercept

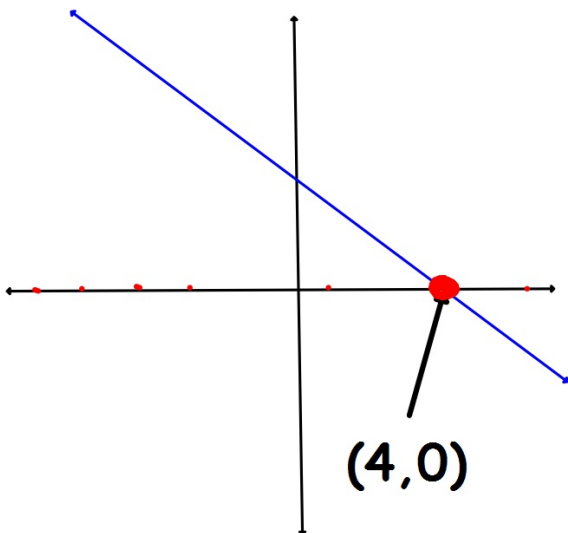


The y -intercept of a line is the point where the line crosses the y -axis.

It occurs when $x=0$



Important Vocabulary: x -intercept



The **x -intercept** of a line is the point where the line crosses the x -axis.

It occurs when $y=0$



Find the intercepts

$$(-7, 0)$$

$$-3x + 7y = 21$$

$$(0, 3)$$

To find the x-intercept,

$$-3x + 7(0) = 21$$

$$-3x = 21$$

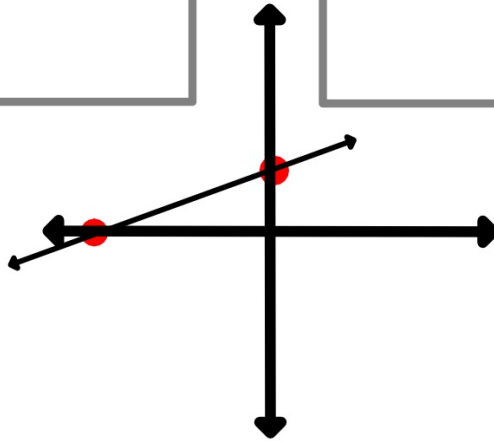
$$x = -7$$

To find the y-intercept,

$$-3(0) + 7y = 21$$

$$7y = 21$$

$$y = 3$$



The "FUN" way to Find the intercepts:
Use Your Finger!



$$-4(\underline{x}) + 8y = -24$$

x-intercept

$$(\underline{6}, 0)$$

y-intercept

$$(0, \underline{-3})$$

The "FUN" way to Find the intercepts:
Use Your Finger!

$$3x - 5y = 30$$

x-intercept y-intercept

$(10, 0)$	$(0, -6)$
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$$+ 7y = 28$$

x-intercept y-intercept

$(-14, 0)$	$(0, 4)$
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Learning Target #3

Graphing Using the Intercepts



Graphing a Linear Equation in Standard Form



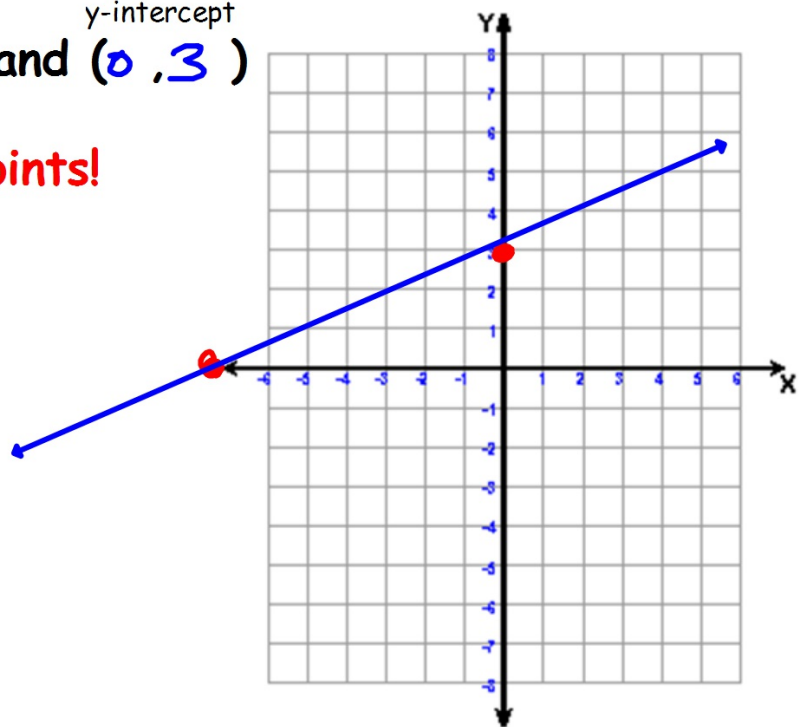
$$-3x + 7y = 21$$

- 1st:** Solve for the x-intercept and the y-intercept
- 2nd:** Graph the x-intercept and the y-intercept points
- 3rd:** Connect the points to graph the line

$$-3x + 7y = 21$$

2nd: Graph $(-7, 0)$ and $(0, 3)$

3rd: Connect the points!



$$6x - 8y = 24$$

1st: Find the intercepts

Quick and Easy: Use Your finger!

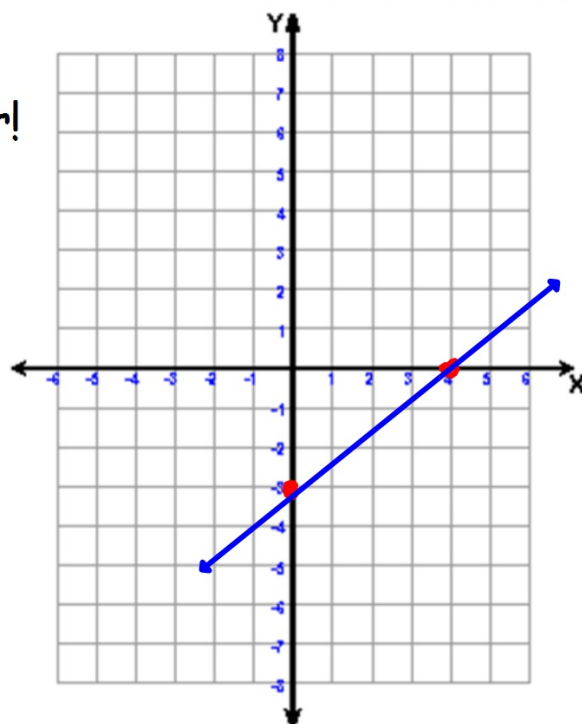
$$6x - 8y = 24$$

x-intercept

y-intercept

2nd: Graph $(4, 0)$ and $(0, -3)$

3rd: Connect the points!



Homework

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#1, 8, 11-17,
19, 20

Redo Eg. $y = 4x + 2$

