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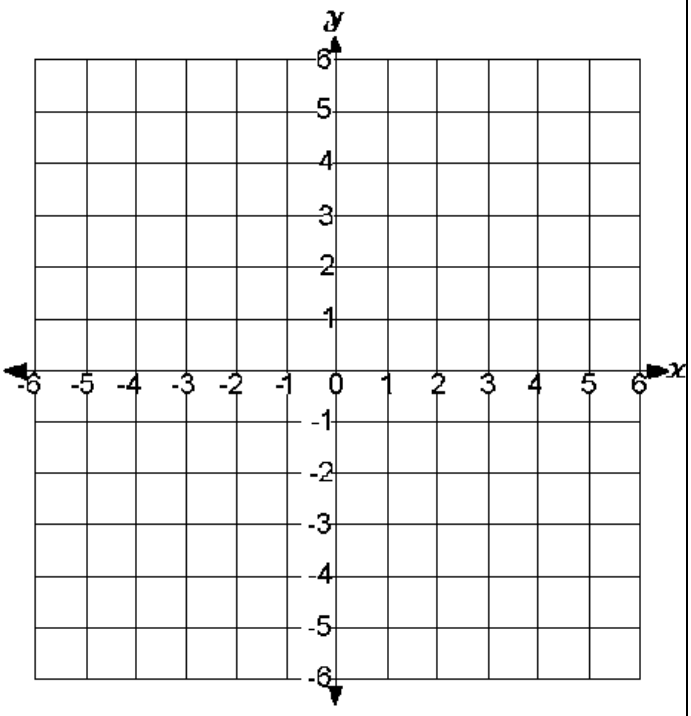
Graphing Linear Equations

Notes	Video Links & Practice Space
Welcome to **your** Toolbox	How to use the toolbox
Vocabulary **Dependent Variable:** the _____ value of a function, typically the y-value **Independent Variable:** the _____ value of a function, typically the x-value **Linear Equation:** a polynomial equation that contains a _____ of _____ 1, but no term of higher degree	**Vocabulary (0:53)**
Plotting Coordinates Review This lesson centers on graphing equations using the coordinate plane. Remember that coordinates are written like the alphabet where x comes before y, or $(x,\ y)$ The _____ is the **horizontal** axis (right to left) The y axis is the _____ axis (up and down) **Graph:** (0,0), (0,2), (-5, 0), (3,4), (-2,5), (-5, -5), (1, -4)	**Plotting Coordinates (4:23)** 

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Graphing Linear Equations by Creating a Table of Points

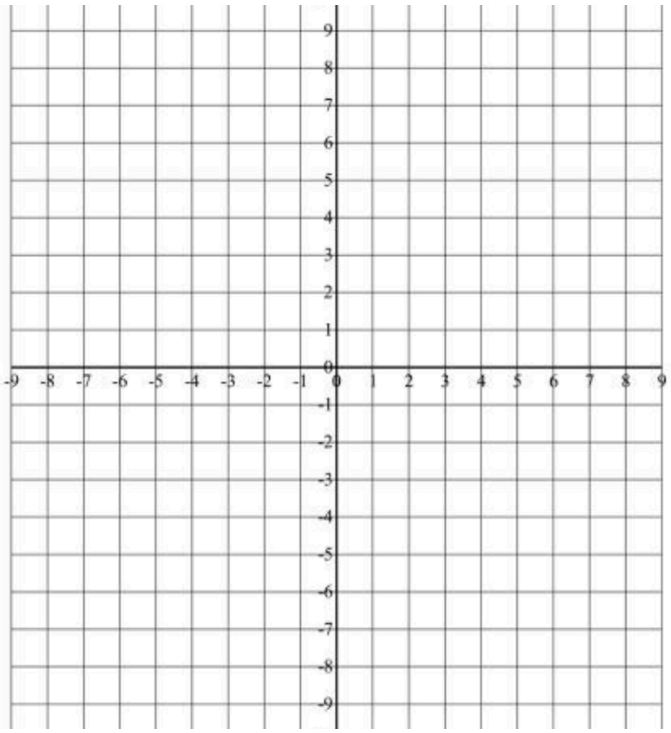
To graph the equation $y = 3x + 2$, you can create a table of values to determine several points on the line.

Choose certain (think small numbers) values that are positive and negative for your input (*x* values) and substitute them into your equation to identify the corresponding *y* values.

Example:

x	y = 3x + 2	y	(x, y)
-2	$y = 3(-2) + 2$	-4	(-2, -4)
-1	$y = 3(-1) + 2$	-1	(-1, -1)
0	$y = 3(0) + 2$	2	(0, 2)
1	$y = 3(1) + 2$	5	(1, 5)
2	$y = 3(2) + 2$	8	(2, 8)

Graphing Linear Equations by Creating a Table of Points (4:39)



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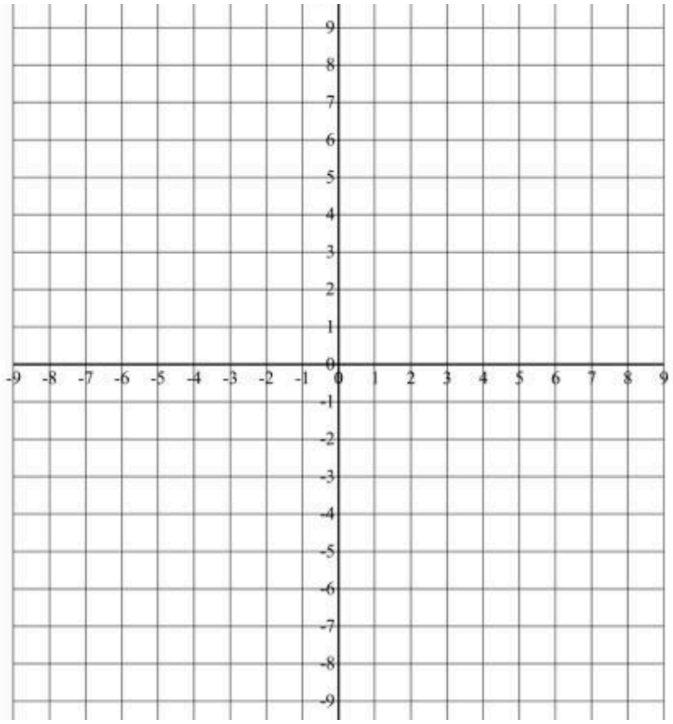
Practice

1. Graph y = 2x by completing the table.

x	y = 2x	y	(x, y)

Graphing Linear Equations by Creating a Table of Points (4:28)



Graphing Linear Equations by Using Slope-Intercept Form | $y = mx + b$

- **Step 1:** Plot the y-intercept

If the b value is 3 the coordinate pair is (0, 3). Plot this first. If there is no b value, such as in the equation: y = 5x that means the y-intercept is the origin, represented by the point (0, 0).

- **Step 2:** Perform the slope $\frac{rise}{run}$ from the y-intercept to plot another point.

Remember that the rise, ___ value in the fraction, will tell you to go up or down. The run, bottom value in the fraction will tell you to go left or ____ .

slope is 3 = $\frac{3\ (up\ 3)}{1\ (right\ 1)}$ slope is -4/3 = $\frac{-4\ (down\ 4)}{3\ (right\ 3)}$

- **Step 3**: Draw a _____ line through the two points

Graphing with Slope-Intercept Form Steps (3:08)

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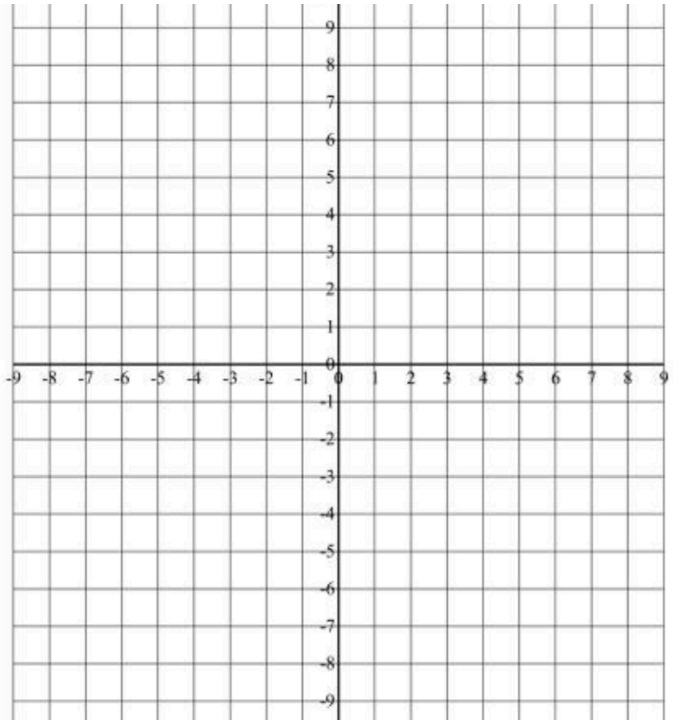
Practice

2. Graph a line with a y-intercept of 5 and slope of -4/3.

Graphing with y-intercept and slope (2:30)

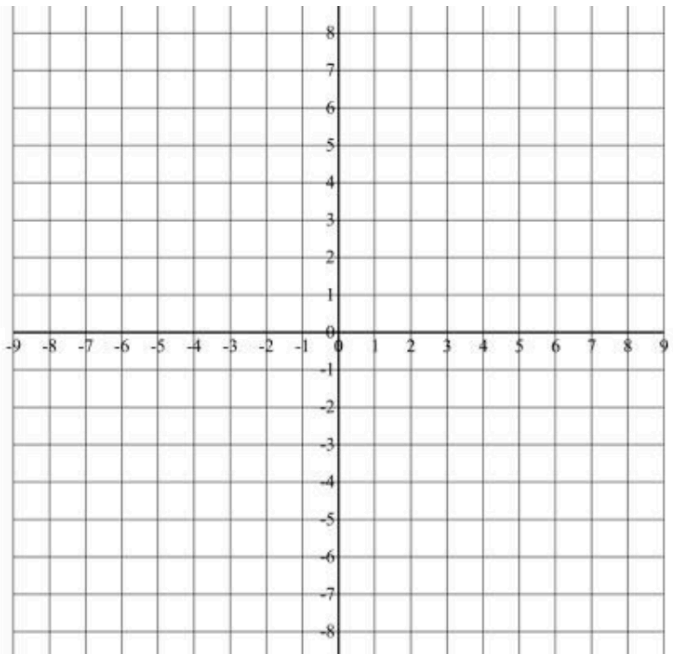


Graphing with Slope-Intercept Form

Graph y = 2x - 3

- **Step 1:** Plot the y-intercept, the b value.
- **Step 2:** Perform the slope $\frac{rise}{run}$ from the y-intercept to plot another point.
- **Step 3**: Draw a straight line through the two points

Graphing Slope-Intercept Form (4:13)



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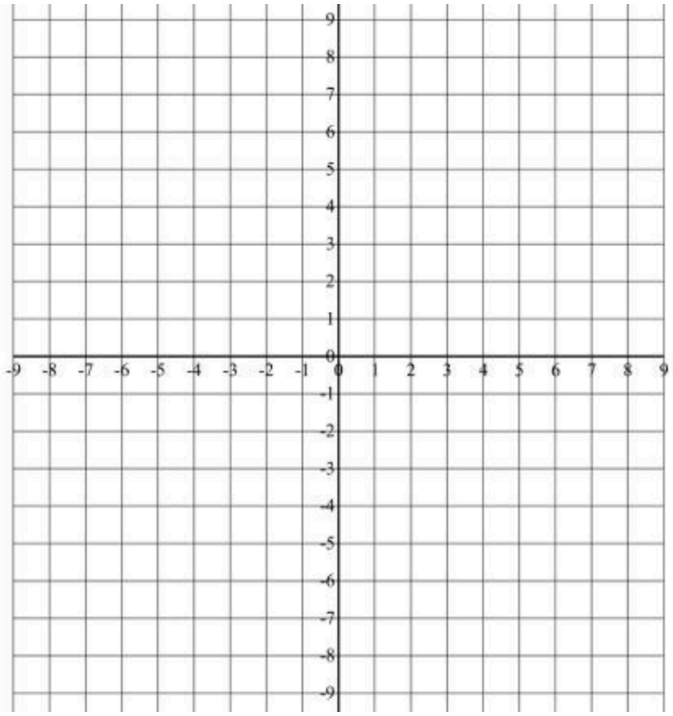
Practice

3. Graph y = -3x

- **Step 1:** Plot the y-intercept, the b value.
- **Step 2:** Perform the slope $\frac{rise}{run}$ from the y-intercept to plot another point.
- **Step 3**: Draw a straight line through the two points

Graphing Slope-Intercept Form (4:04)



Linear Equations from Written Descriptions

Linear equations are everywhere and being able to represent a real-world problem using a graph helps you better understand the situation and make predictions.

The value of the _____ **variable**, or x-variable, determines the value of the **dependent variable**, or_____.

Imagine you are monitoring how many bottles of water you drink in a week. You drank 1 bottle yesterday (Sunday) and will drink 3 bottles each day for the rest of the week…

Let the independent variable be the _____and the dependent variable be the _____.

Can we create a graph to model this scenario?

Linear Equations with written descriptions (1.36)

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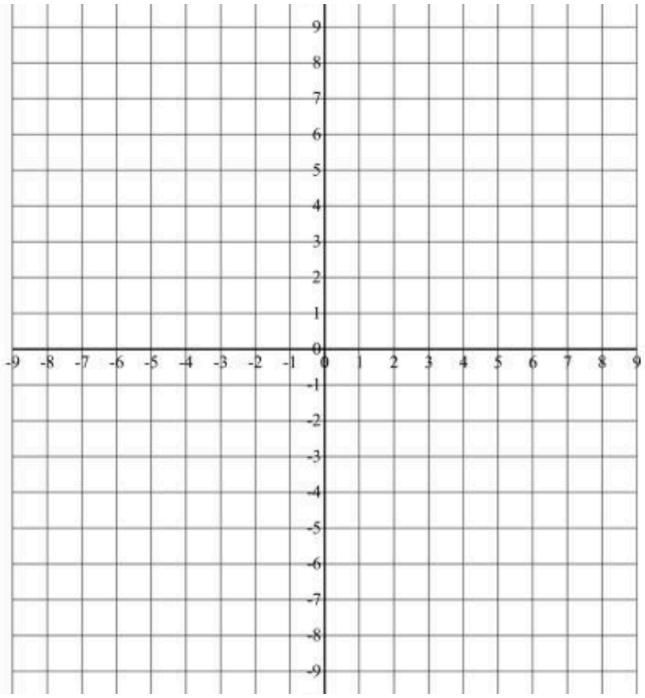
Graphing Linear Equations from Written Descriptions

Graph the relationship between the number of days and the number of water bottles consumed.

You are monitoring how many bottles of water you drink in a week. You drank 1 bottle yesterday (Sunday) and will drink 3 bottles each day for the rest of the week…

Graphing from written descriptions (3:31)



Practice

4. Amy starts with $45 dollars in her Starbucks app each month. Her order costs $10 each visit. Create an equation and graph for this relationship.

   • How many times can she afford to go each month?

   • Can she go 5 times a month?

   • What does the slope represent?

   • What does the y-intercept represent?

Real-world graphing application (5:48)