

7th Grade Advanced Math

Book 1: Linear Equations

Block 3: Using Linear Equations

Guided Practice

(notes)

Name: _____

Period: _____

You may use your guided notes on the test!

Lesson 3.1 – Graphing Using Slope-Intercept Form

Vocabulary:

Slope-Intercept Form: _____

Good to Know!

Slope-intercept form is the most common equation used to represent a linear function. It is called this because the slope and the y -intercept are easily identified.

The slope of the line is represented by _____.

The y -intercept is _____.

The ordered pair for the y -intercept will be $(0, \underline{\hspace{1cm}})$.

$$y = mx + b$$

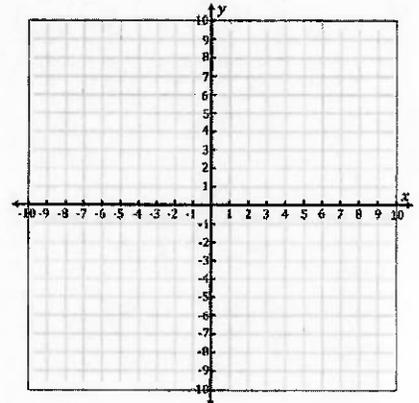
Graph $y = \frac{1}{3}x - 2$. Clearly mark at least 3 points on the line.

$m = \underline{\hspace{1cm}}$ $b = \underline{\hspace{1cm}}$

Start by graphing the _____ on the coordinate plane.

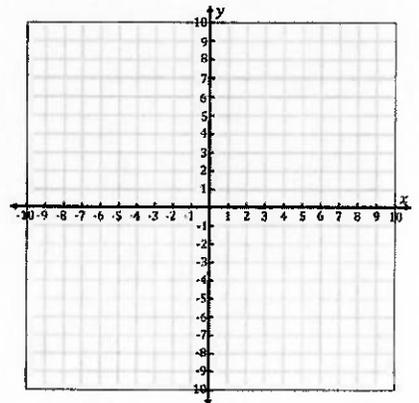
Use the _____ to find at least _____ more points.

Draw a straight line through the points. Put an arrow on each end.

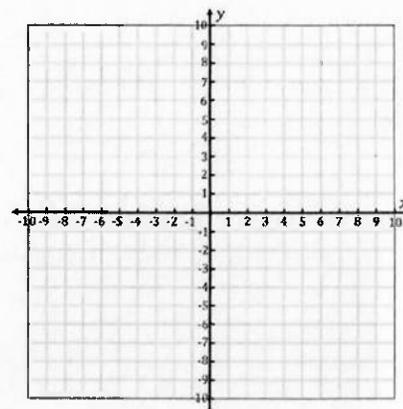


Graph $y = -\frac{1}{2}x + 4$. Clearly mark at least three points on the line.

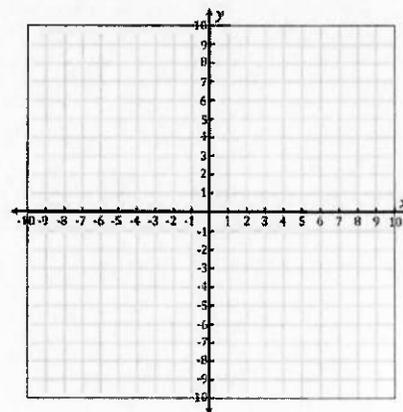
$m = \underline{\hspace{1cm}}$ $b = \underline{\hspace{1cm}}$



$$y = 6 - 2x$$

 $m = \underline{\hspace{2cm}}$ $b = \underline{\hspace{2cm}}$ 

$$y = -\frac{7}{2}x + 1$$

 $m = \underline{\hspace{2cm}}$ $b = \underline{\hspace{2cm}}$ 

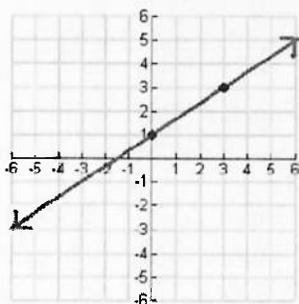
Lesson 3.2 – Writing Linear Equations for Graphs

Steps for Writing a Linear Equation from a Graph:

1. Locate the _____ on the graph.
2. Find the _____ of the line.
3. Write the equation in _____, $y = mx + b$.

Determine the slope and y-intercept of each graph. Write the equation for each graph in slope-intercept form.

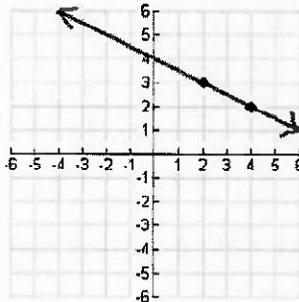
a.



y-intercept = _____ m = _____

Equation: _____

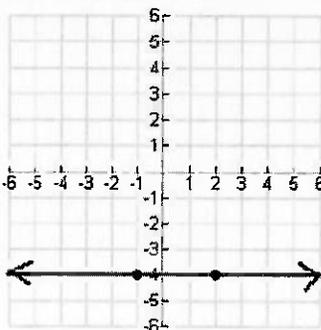
b.



y-intercept = _____ m = _____

Equation: _____

c.



y-intercept = _____ m = _____

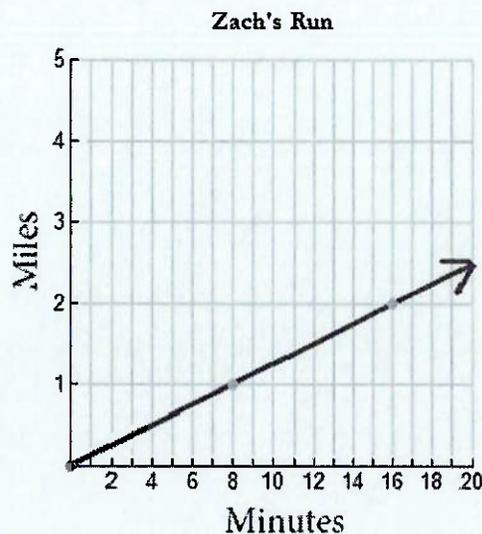
Equation: _____

- a. Find the slope-intercept equation that represents the situation shown on the graph.

y-intercept = _____ m = _____

Equation: _____

- b. Use your equation to determine how far Zach will have gone in 28 minutes.



- c. Use your equation to determine how long it will take Zach to run 10 miles.

Lesson 3.3 – Writing Linear Equations from Key Information

Write the equation of a line that has a slope of -2 and a y -intercept of 5 .

Slope = _____ y-intercept = _____ Equation = _____

Write the equation of the line that has a slope of $\frac{1}{2}$ and a y -intercept of -3 .

Slope = _____ y-intercept = _____ Equation = _____

Lesson 3.4 – Different Forms of Linear Equations



Good to Know!

Linear equations come in many different forms. So far you have used the slope-intercept form. In this lesson, you will work with linear equations in other forms and convert them into slope-intercept form in order to graph the equations.

Slope-Intercept Form	Point-Slope Form	Standard Form

Convert the following from **STANDARD** form to **SLOPE-INTERCEPT** form.

a. $-5x + 2y = -20$

b. $x - 3y = 9$

Convert the following from **POINT-SLOPE** form to **SLOPE-INTERCEPT** form.

a. $y = \frac{1}{2}(x - 4) + 1$

1. Use the Distributive Property to remove any parentheses.
2. Combine all like terms on the same side of the equals sign.
3. Isolate y by balancing the equation using the Properties of Equality.

b. $y + 4 = -3(x - 2)$

4. Re-write the equation in slope-intercept form.

Lesson 3.5 – More Graphing Linear Equations

Explore!

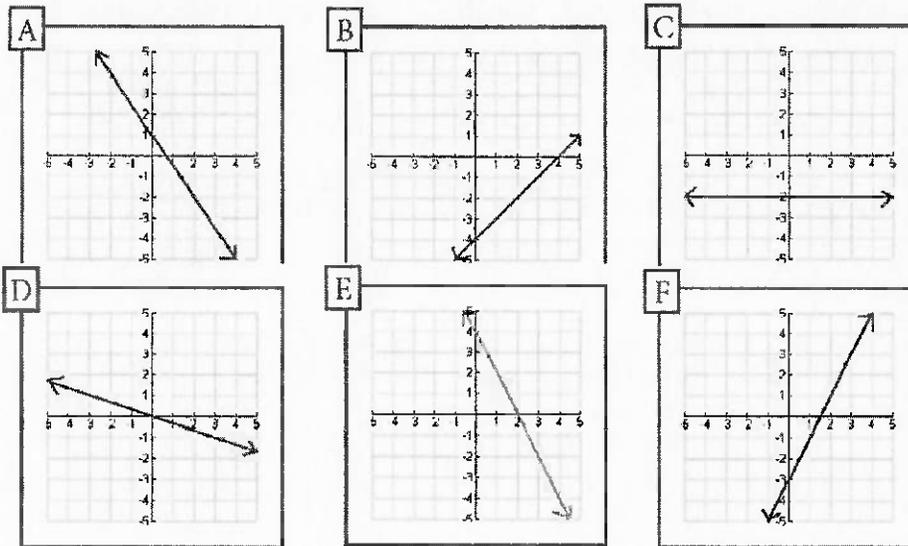
Match Me

Jared and Wendy are playing a matching game. Each card in the deck has either a graph or a linear equation on it. The goal of the game is to be the first to match the six Equation Cards to their corresponding Graph Cards.

Step 1 Convert each Equation Card to slope-intercept form.

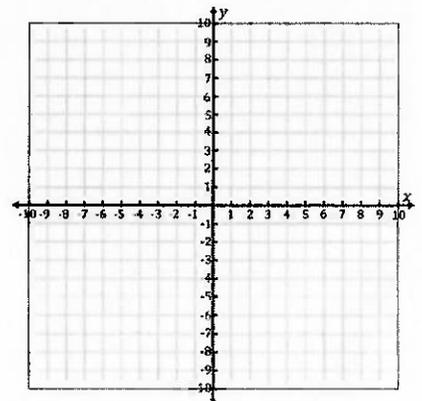
1	$y + 6 = -2(x - 5)$	2	$6y = -12$	3	$y = -\frac{1}{3}(x + 3) + 1$
4	$y - 5 = 2(x - 4)$	5	$3x + 2y = 2$	6	$-3x + 3y = -12$

Step 2 Match each Equation Card to its corresponding Graph Card, found on the following slide.

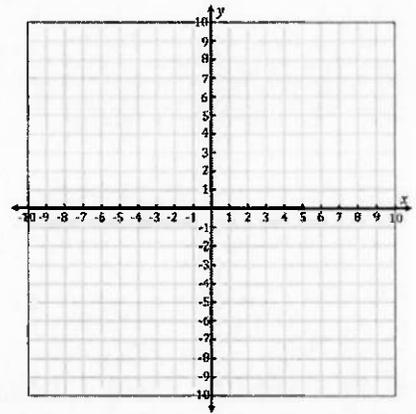


Convert the equation to slope-intercept form and then graph.

a. $4x + 3y = 12$



b. $y = \frac{1}{2}(x - 4) + 3$



 **Good to Know!**

Every line has an infinite number of points that make up the line. In certain situations, verification is needed to determine whether or not a point lies on a certain line.

In order to determine this, the equation DOES NOT need to be graphed. The x - and y -values from an ordered pair can be substituted for the x - and y -values in the linear equation. If the values make the equation true, then the point lies on the line.

Determine if each point is on the given line.

a. Is the point $(3, -4)$ on the line $5x + 2y = 7$?

b. Is the point $(0, 5)$ on the line $y + 3 = 2(x + 3)$?

Lesson 3.6 – Graphing Linear Inequalities in Two Variables

Explore!

- Step 1** Juniper is thinking of two numbers, x and y , whose sum is at least 6.
- Write an inequality that represents this statement.
 - Find 6 pairs of numbers Juniper may be thinking of. List the sets of two numbers as ordered pairs (x, y) .

- Step 2** How many possible pairs of numbers fit Juniper's description? Explain your reasoning.

- Step 3** On a coordinate plane, graph at least three ordered pairs that have a sum of exactly six (remember that Juniper said the sum of her numbers is at least six). Draw a solid line through these points. This is the boundary line for the solution set. All values on this line have ordered pairs that have a sum of 6.

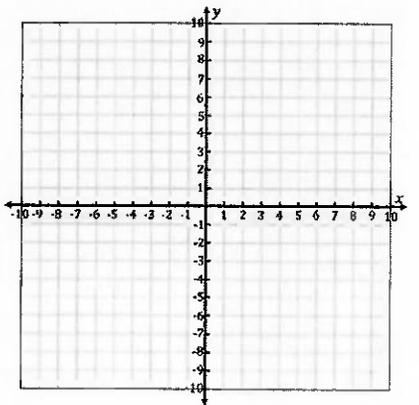
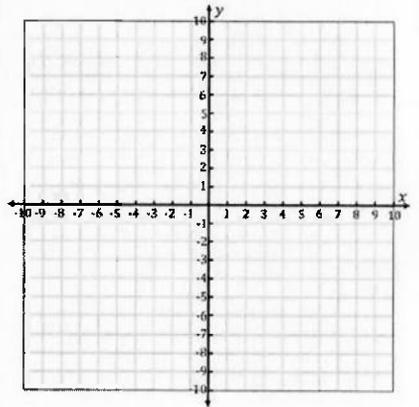
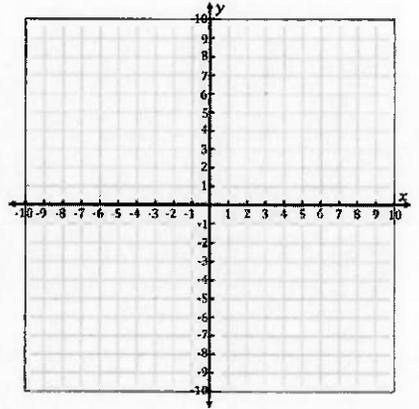
- Step 4** Plot at least three of your ordered pairs from **Step 1** on your graph. Are these numbers "above" or "below" your boundary line? Is it possible for some of your points to be on one side of the boundary line and other points on the opposite side? Explain your reasoning.

- Step 5** Shade the coordinate plane on the side of the boundary line you placed your ordered pairs on in **Step 4**. This shows all of the possible solutions to Juniper's description of her two numbers. Choose another point in your shaded area as a test point. Do the x - and y -values add up to more than 6? If so, you shaded the correct side of the boundary line.

- Step 6** On a new coordinate plane, begin to graph the inequality $y < \frac{1}{2}x - 1$ by graphing three points on the line $y = \frac{1}{2}x - 1$. DO NOT connect the points with a solid line. Test one of the points on your line in your inequality. What do you notice?

- Step 7** Connect your points with a dashed line to show that these points are not included in the solution. Choose a test point on either side of the boundary line. Substitute the point into the original inequality. If the x - and y -values make the statement true, shade that side of the boundary line. If they do not, shade the side that does not contain your test point.

- Step 8** Graph $y \leq -2x + 3$ on a new coordinate plane.

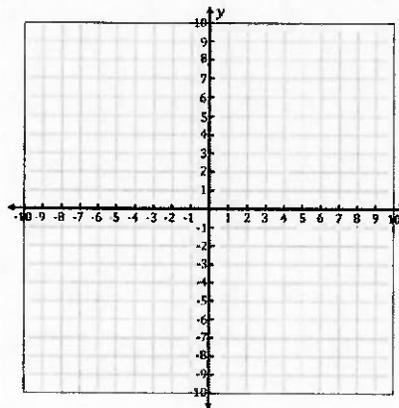


Graphing Linear Inequalities in Two Variables

1. Graph the boundary line by replacing the inequality sign with an equal sign.
 - a. If the inequality sign is $>$ or $<$, use a dashed boundary line.
 - b. If the inequality sign is \geq or \leq , use a solid boundary line.
2. Choose a test point which is not on the boundary line. Substitute the x - and y -values into the original inequality.
3. If the test point makes a true statement when substituted into the inequality, shade the side of the boundary line that contains that point. If the statement is false, shade the side of the boundary line that does not contain the test point.

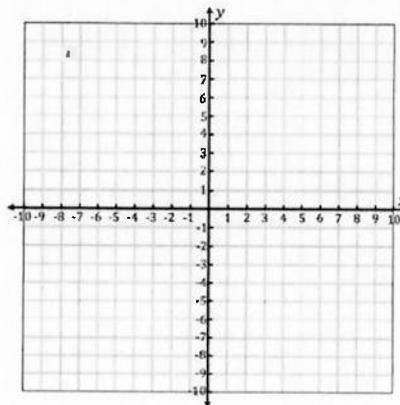
Graph $y > 3x - 4$.

x	y



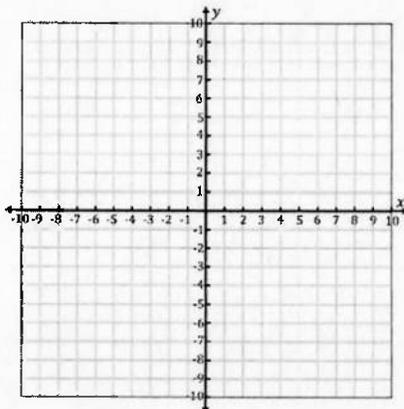
Graph $y < \frac{1}{2}x + 3$.

x	y



Graph $x + 2y \leq 4$.

x	y



Graph $x + 2y \leq 4$.

x	y

