Race To Tie 2 Calendar (90 min block)

Week	Mon	Tues	Wed	Thur	Fri	
1	- Do Now: Linear Systems 1 - Entry Doc - Workshop: Speed Conversion	- Do Now: Circumferences/Revolutions - Systems Intro - Part 1: LinkBot Car 1 data	- Graphing Systems using Desmos - Part 2: LinkBot Car 2 data	- Do Now: Linear Systems 2 - Workshop: Solving Linear Systems Algebraically	- Do Now: Linear Systems 3 - Linear Systems: Group Quiz 1 - Linkbot equation verification	---------- Scaffolded Code for Race to Tie 2 - ch code - py code ----------
2	- Do Now: Linear Systems 4 - Linear Systems Review - Part 3: LinkBots Together	- Do Now: Linear Systems 5 - Finish Checklist - Run races/Twists	- Finish races/twists - Presentations - Solving Systems Algebraically Recap/Practice	- Do Now: Linear Systems 6 - Solving Systems Recap (finish)	- Do Now: Linear Systems 7 - Group Quiz 2	
3	- Review	- Unit Assessment				

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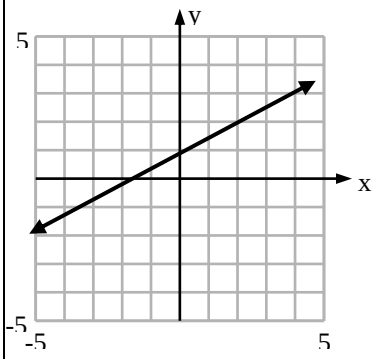
Date: _____ Per: __

Do Now: Linear Systems 1

1. Which of the following is the graph of

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

A



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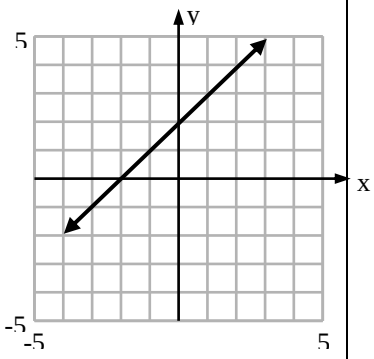

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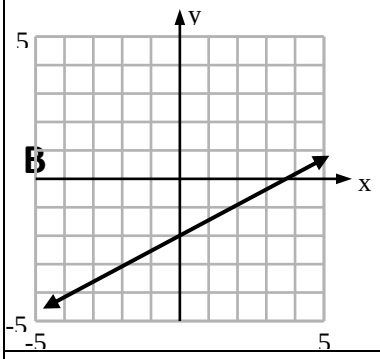

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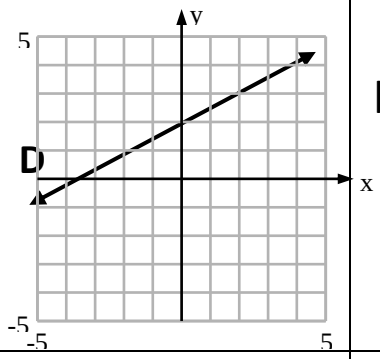


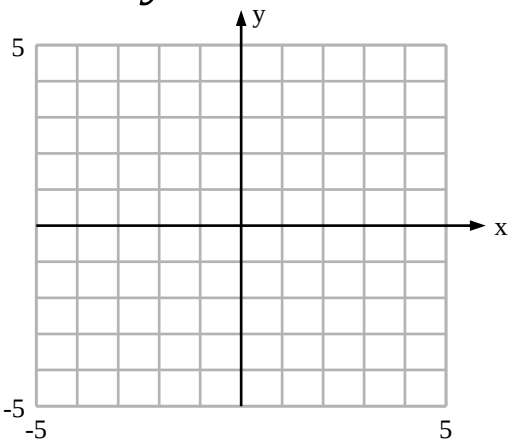
2. Find the slope and the *y*-intercept of each line.

a) $y = -2x + 3$

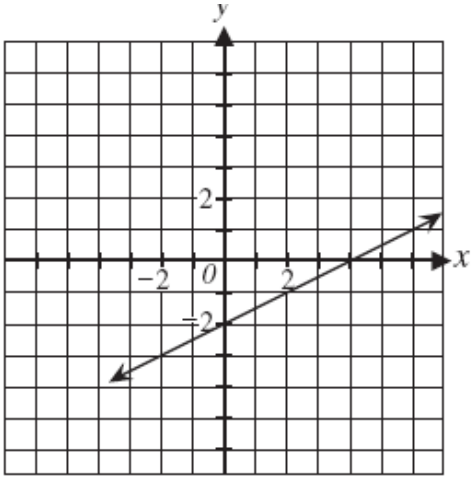
b) $-3x + 2y = 8$

3. Graph the line.

$$-5x + 3y = -15$$



4. What is the slope of the line shown?



Race to Tie 2:

Dear Students,

We just finished Race to Tie and everyone did a great job of getting their bot to tie the pace car. Realizing how easy you made the last lab look, I decided to add some more challenges to the format. In Race to Tie 2, you will have two robots that travel different speeds race to tie each other. Robot 1 must travel three times as fast as Robot 2. Robot 1 must start the race 10 inches up the racetrack while Robot 2 must start the race 40 inches up the racetrack. You may pick whatever speeds you want, just as long as Robot 1 is three times faster than Robot 2. So that everyone in class can understand your excellence, each team must show that their Linkbot car placement will result in a tie. The presentation must include:

- Names for your Linkbot cars.
- A graph showing the motion of both cars.
- The velocity of each car.
- The final equation for each car.
- The length of time needed to complete the race.
- The point at which the Linkbot cars will tie.

Once your explanation is accepted, your team will have two chances to get the Linkbot cars to tie.

Sincerely,
Your Teacher

Know	Need to Know	Next Steps

Speed Conversion: Degrees per second vs. Centimeters per second

A. The Linkbot has wheels with a diameter of 9.2 cm. How can we find out how far the wheel will go in one full 360 degree turn?

We will use the formula for the Circumference of a Circle: $C = 2\pi$(radius)

The distance the wheel rolls in one turn is equal to the distance around the wheel.

So the distance is about 28.9 cm.

B. A Linkbot's speed is controlled by the number of degrees it turns in one second. So a speed of 360 degrees per second means the wheel will turn exactly one time every second.

How many times will the wheel turn if it rotates 720 degrees?

How many seconds will it take?

Note: Linkbots do not work to well at speeds over 200 degrees per second. So we will usually use speeds below that.

C. How many times will the wheel turn in 4 seconds, if its speed is 180 degrees per second?

D. How many times will the wheel turn in 8 seconds, if its speed is 90 degrees per second?

E. If a Linkbot's wheels are turning at a speed of 180 degrees per second for 4 seconds, how can we find out how far it will go? Explain the reasoning for each step below.

In four seconds the wheel will turn 4*180 degrees = 720 degrees. _____

720 degrees/ 360 degrees per turn = 2 turns _____

2 turns(28.9 cm per turn)= 57.8 cm _____

F. If a Linkbot's wheels are turning at a speed of 90 degrees per second for 12 seconds, how far it will go?

G. Suppose we need our Linkbot to travel exactly 40 cm in exactly 6 seconds. What speed will the robot have to travel in degrees per second to achieve this?

6sec(s)=40cm
s=40cm/6sec
s=6.67 cm per second

However this speed is in cm per second and we require our speed in degrees per second. Hint: Consider how far the car will move if the wheel only turns one degree?

How can we convert this speed into degrees per second?

(S degrees per second/360 degrees per turn) gives the number of turns the wheel makes in 1 second. There are 28.9 cm per turn.

so…

(S degrees per second/360 degrees per turn)(28.9 cm per turn) gives the number of centimeters per second which in this case is 6.67 cm/sec.

thus we can write the equation:

(S deg per sec/360 deg per turn)(28.9 cm per turn) = 6.67 cm per sec

and solve:

S deg per sec=(6.67 cm per sec)(360 deg per turn)/(28.9 deg per turn)

and simplify:

S=83.08 degrees per second

H. Suppose we need our Linkbot to travel 80 cm in 10 seconds. What speed will the robot have to travel in degrees per second to achieve this?

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Do Now: Circumferences/Revolutions

Show ALL work and box final answers.

1.) If a LinkBot's wheels are turning at a speed of 180 degrees per second for 10 seconds, how far will it travel (in inches)?

2.) If a LinkBot's wheels are turning at a speed of 280 degrees per second for 9 seconds, how far will it travel (in inches)?

3.) Suppose we need our Linkbot to travel exactly 60 inches in exactly 5 seconds. What speed will the robot have to travel in degrees per second to achieve this?

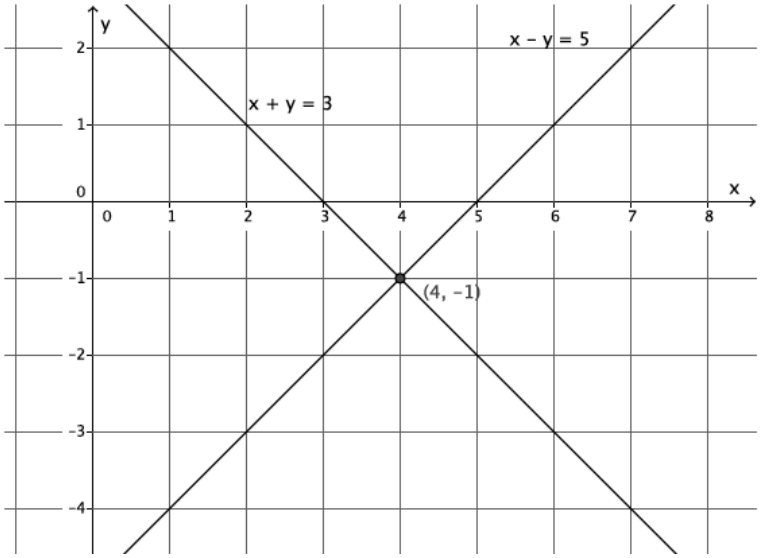
4.) Suppose we need our Linkbot to travel exactly 75 inches in exactly 17 seconds. What speed will the robot have to travel in degrees per second to achieve this?

Workshop: Systems Intro

Lesson Summary

When the graphs of a system of linear equations are sketched, and if they are not parallel lines, then the point of intersection of the lines of the graph represents the solution to the system. Two distinct lines intersect at most at one point, if they intersect. The coordinates of that point (x, y) represent values that make both equations of the system true.

Example: The system $\begin{cases} x + y = 3 \\ x - y = 5 \end{cases}$ graphs as shown below.



The lines intersect at $(4, -1)$. That means the equations in the system are true when $x = 4$ and $y = -1$.

$$\begin{aligned} x + y &= 3 \\ 4 + (-1) &= 3 \\ 3 &= 3 \end{aligned}$$

$$\begin{aligned} x - y &= 5 \\ 4 - (-1) &= 5 \\ 5 &= 5 \end{aligned}$$

Problem Set

1. Sketch the graphs of the linear system on a coordinate plane: $\begin{cases} y = \frac{1}{3}x + 1 \\ y = -3x + 11 \end{cases}$

   a. Name the ordered pair where the graphs of the two linear equations intersect.

   b. Verify that the ordered pair named in part (a) is a solution to $y = \frac{1}{3}x + 1$.

   c. Verify that the ordered pair named in part (a) is a solution to $y = -3x + 11$.

2. Sketch the graphs of the linear system on a coordinate plane: $\begin{cases} y = \frac{1}{2}x + 4 \\ x + 4y = 4 \end{cases}$

   a. Name the ordered pair where the graphs of the two linear equations intersect.

   b. Verify that the ordered pair named in part (a) is a solution to $y = \frac{1}{2}x + 4$.

   c. Verify that the ordered pair named in part (a) is a solution to $x + 4y = 4$.

3. Sketch the graphs of the linear system on a coordinate plane: $\begin{cases} y = 2 \\ x + 2y = 10 \end{cases}$

   a. Name the ordered pair where the graphs of the two linear equations intersect.

   b. Verify that the ordered pair named in part (a) is a solution to $y = 2$.

   c. Verify that the ordered pair named in part (a) is a solution to $x + 2y = 10$.

4. Sketch the graphs of the linear system on a coordinate plane: $\begin{cases} -2x + 3y = 18 \\ 2x + 3y = 6 \end{cases}$

   a. Name the ordered pair where the graphs of the two linear equations intersect.

   b. Verify that the ordered pair named in part (a) is a solution to $-2x + 3y = 18$.

   c. Verify that the ordered pair named in part (a) is a solution to $2x + 3y = 6$.

5. Sketch the graphs of the linear system on a coordinate plane: $\begin{cases} x + 2y = 2 \\ y = \frac{2}{3}x - 6 \end{cases}$

   a. Name the ordered pair where the graphs of the two linear equations intersect.

   b. Verify that the ordered pair named in part (a) is a solution to $x + 2y = 2$.

   c. Verify that the ordered pair named in part (a) is a solution to $y = \frac{2}{3}x - 6$.

6. Without sketching the graph, name the ordered pair where the graphs of the two linear equations intersect.

$$\begin{cases} x = 2 \\ y = -3 \end{cases}$$

Race to Tie 2 - Linkbot Car 1

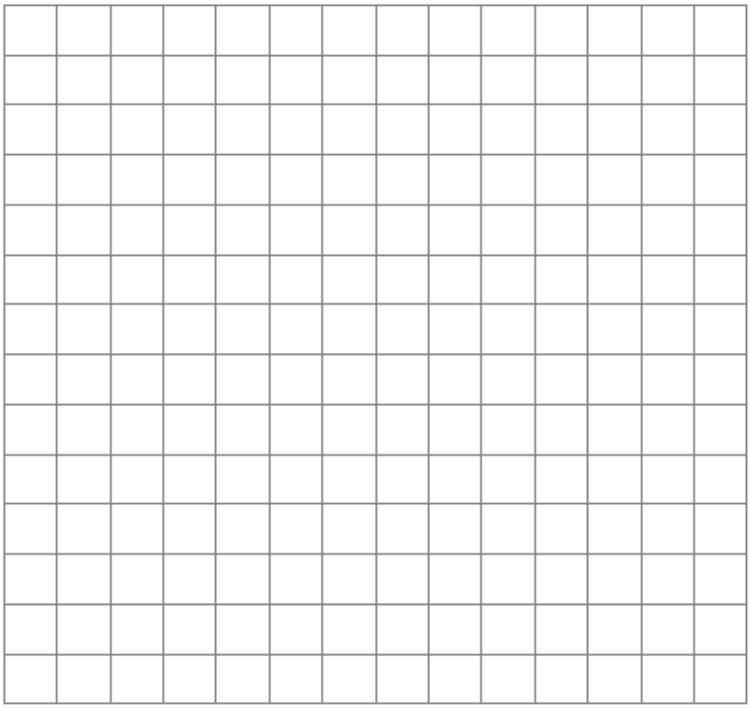
Name:_____ Date:_____

Your speed is _____.

The code for changing your Linkbot car's speed is: robot.setJointSpeeds(*speed*, 0, *speed*)

Data:

Graph:



1. What is the equation for the car?

2. How did you find the equation?

3. What does the slope mean?

4. How far will the car go in 5 seconds?

5. How long will it take for the car to go 3 meters?

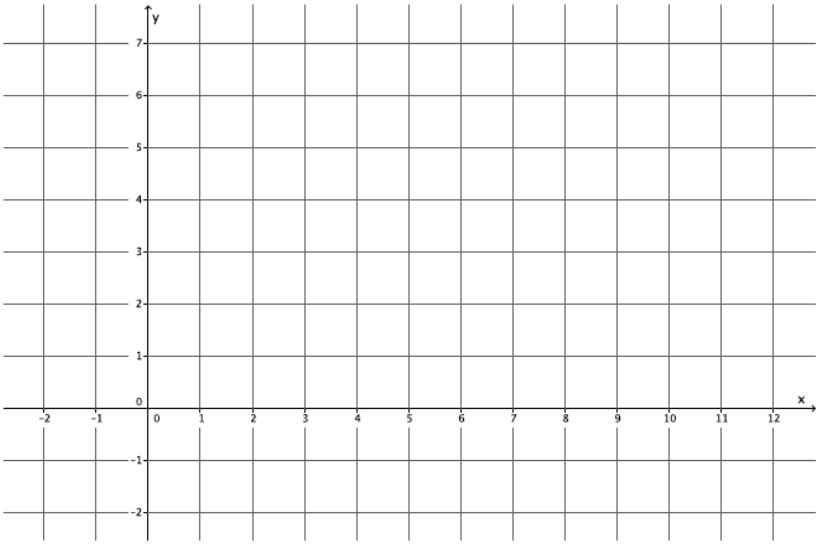
Workshop: Graphing Systems

Lesson 25: Geometric Interpretation of the Solutions of a Linear System

Classwork

Exploratory Challenge/Exercises 1–5

1. Sketch the graphs of the linear system on a coordinate plane: $\begin{cases} 2y + x = 12 \\ y = \frac{5}{6}x - 2 \end{cases}$



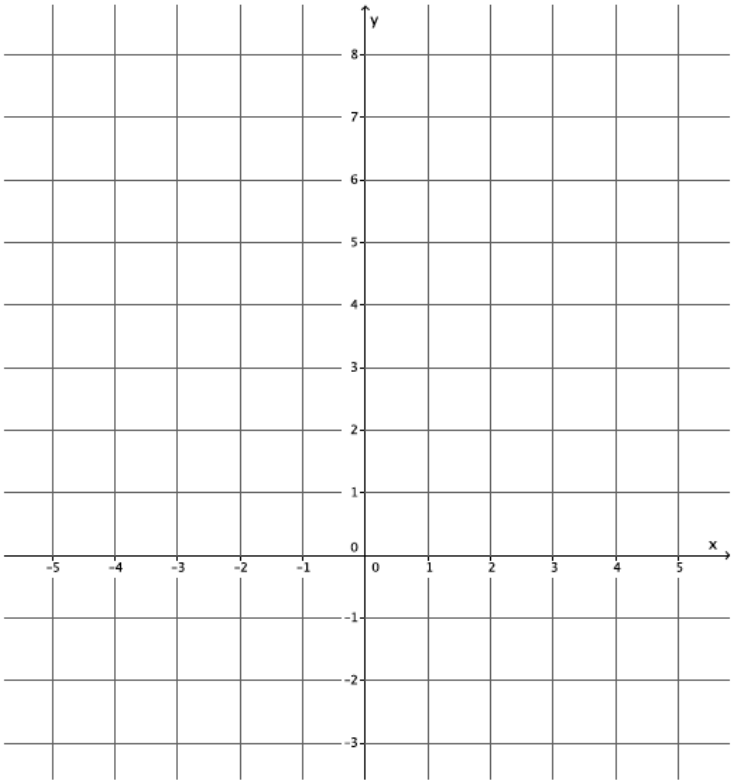
a. Name the ordered pair where the graphs of the two linear equations intersect.

b. Verify that the ordered pair named in part (a) is a solution to $2y + x = 12$.

c. Verify that the ordered pair named in part (a) is a solution to $y = \frac{5}{6}x - 2$.

d. Could the point $(4, 4)$ be a solution to the system of linear equations? That is, would $(4, 4)$ make both equations true? Why or why not?

2. Sketch the graphs of the linear system on a coordinate plane: $\begin{cases} x + y = -2 \\ y = 4x + 3 \end{cases}$



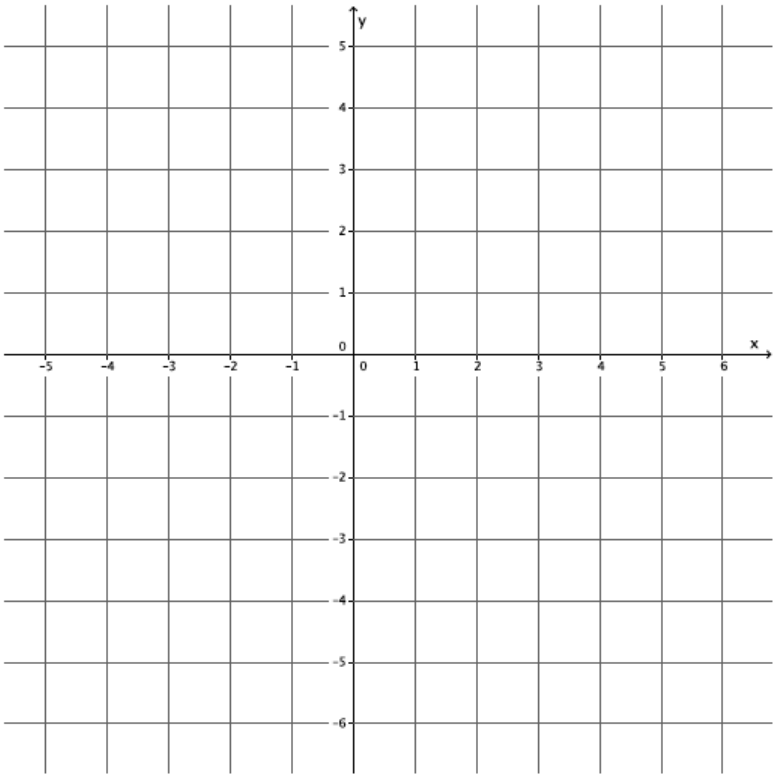
a. Name the ordered pair where the graphs of the two linear equations intersect.

b. Verify that the ordered pair named in part (a) is a solution to $x + y = -2$.

c. Verify that the ordered pair named in part (a) is a solution to $y = 4x + 3$.

d. Could the point $(-4, 2)$ be a solution to the system of linear equations? That is, would $(-4, 2)$ make both equations true? Why or why not?

3. Sketch the graphs of the linear system on a coordinate plane: $\begin{cases} 3x + y = -3 \\ -2x + y = 2 \end{cases}$



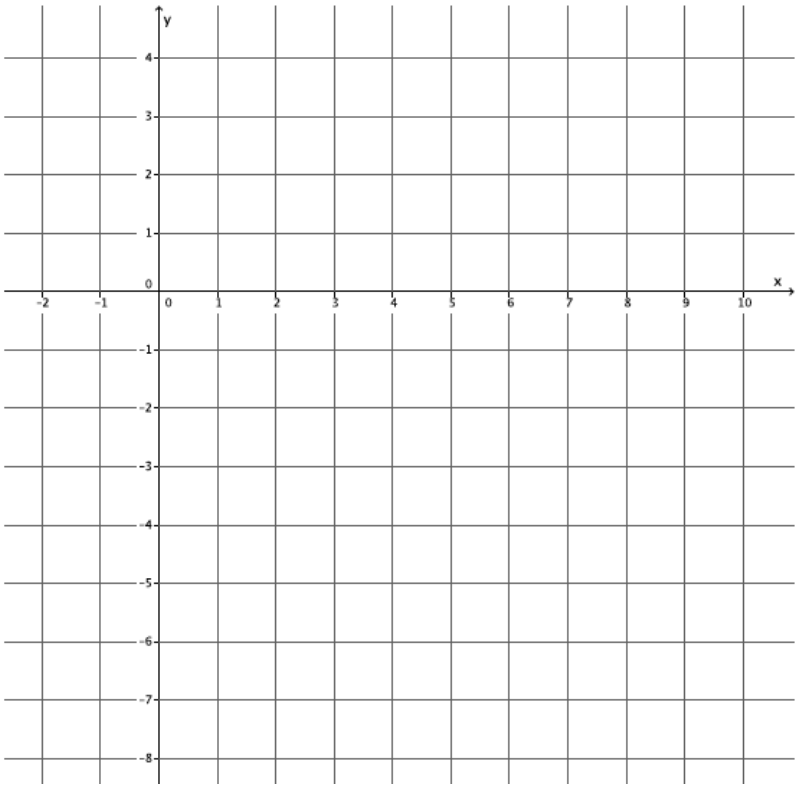
a. Name the ordered pair where the graphs of the two linear equations intersect.

b. Verify that the ordered pair named in part (a) is a solution to $3x + y = -3$.

c. Verify that the ordered pair named in part (a) is a solution to $-2x + y = 2$.

d. Could the point $(1, 4)$ be a solution to the system of linear equations? That is, would $(1, 4)$ make both equations true? Why or why not?

4. Sketch the graphs of the linear system on a coordinate plane: $\begin{cases} 2x - 3y = 18 \\ 2x + y = 2 \end{cases}$



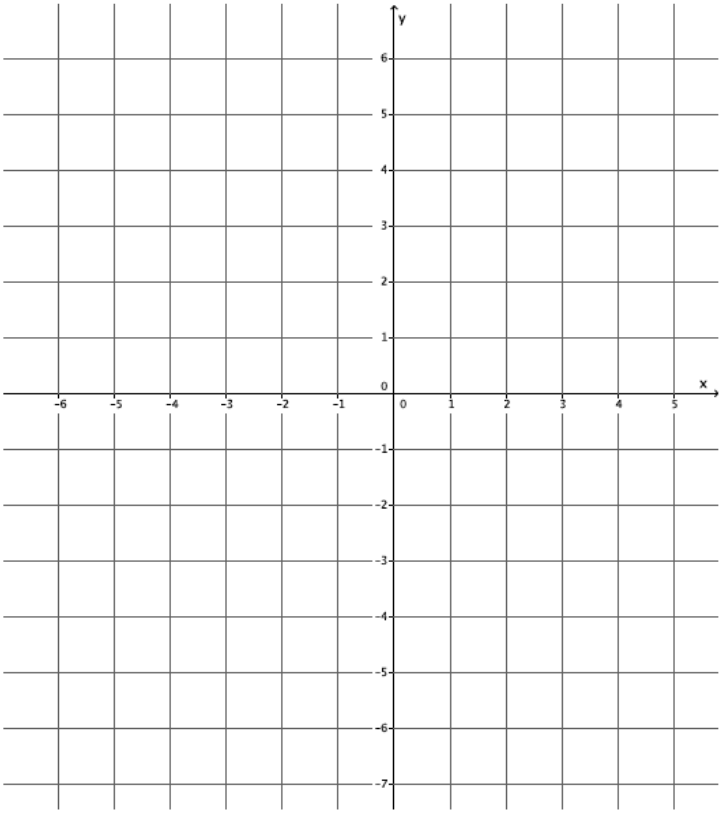
a. Name the ordered pair where the graphs of the two linear equations intersect.

b. Verify that the ordered pair named in part (a) is a solution to $2x - 3y = 18$.

c. Verify that the ordered pair named in part (a) is a solution to $2x + y = 2$.

d. Could the point $(3, -1)$ be a solution to the system of linear equations? That is, would $(3, -1)$ make both equations true? Why or why not?

5. Sketch the graphs of the linear system on a coordinate plane: $\begin{cases} y - x = 3 \\ y = -4x - 2 \end{cases}$



a. Name the ordered pair where the graphs of the two linear equations intersect.

b. Verify that the ordered pair named in part (a) is a solution to $y - x = 3$.

c. Verify that the ordered pair named in part (a) is a solution to $y = -4x - 2$.

d. Could the point $(-2, 6)$ be a solution to the system of linear equations? That is, would $(-2, 6)$ make both equations true? Why or why not?

Exercise 6

6. Write two different systems of equations with $(1, -2)$ as the solution.

Race to Tie 2 - Linkbot Car 2

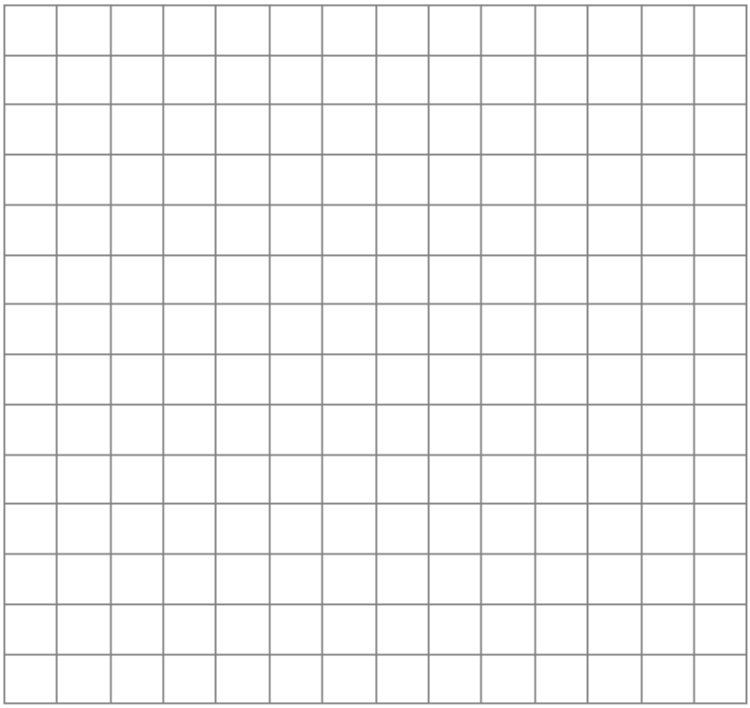
Name:_____ Date:_____

The speed you chose is _____.

The code for changing your Linkbot car's speed is: robot.setJointSpeeds(*speed*, 0, *speed*)

Data:

Graph:



1. What is the equation for the car?

2. How did you find the equation?

3. What does the slope mean?

4. How far will the car go in 4 seconds?

5. How long will it take for the car to go 6 meters?

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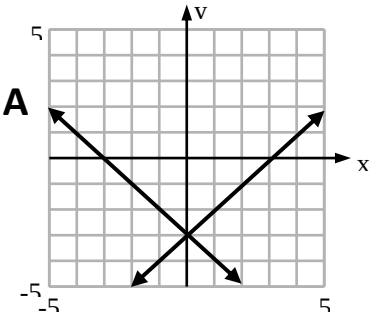
Do Now: Linear Systems 2

1) Which graph represents the system of equations shown below?

$y = -x + 3$

$y = x + 3$

A



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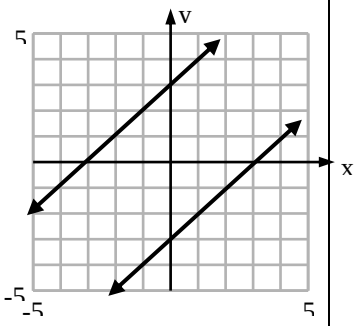

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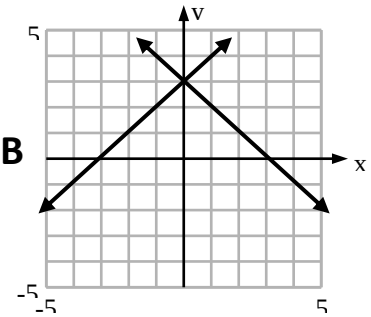

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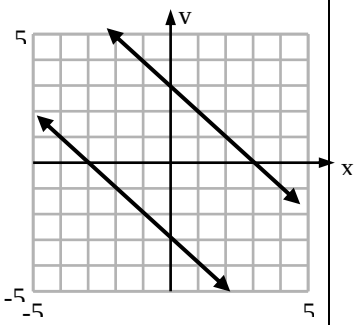
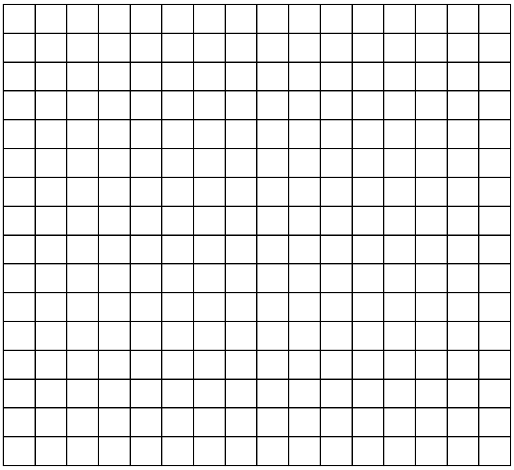


What is the solution of the system?

2) Solve the system by graphing.

$y = x - 2$

$y = x + 1$



3) Match each statement in the first column with the correct description from the second column.

1. parallel lines	A. infinite solutions
2. intersecting lines	B. no solution
3. same line	C. one solution

4) Determine if the ordered pair (-2, 5) is a solution for the equation.

$y = -2x + 1$

Workshop: Solving Linear Equations

Lesson 28: Another Computational Method of Solving a Linear System

Classwork

Example 1

Use what you noticed about adding equivalent expressions to solve the following system by elimination.

$$\begin{cases} 6x - 5y = 21 \\ 2x + 5y = -5 \end{cases}$$

Example 2

Solve the following system by elimination.

$$\begin{cases} -2x + 7y = 5 \\ 4x - 2y = 14 \end{cases}$$

Example 3

Solve the following system by elimination.

$$\begin{cases} 7x - 5y = -2 \\ 3x - 3y = 7 \end{cases}$$

Exercises

Each of the following systems has a solution. Determine the solution to the system by eliminating one of the variables. Verify the solution using the graph of the system.

1. $\begin{cases} 6x - 7y = -10 \\ 3x + 7y = -8 \end{cases}$

2. $\begin{cases} x - 4y = 7 \\ 5x + 9y = 6 \end{cases}$

3. $\begin{cases} 2x - 3y = -5 \\ 3x + 5y = 1 \end{cases}$

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Do Now: **Linear Systems 3**

1)

$$y = 3x - 5$$
$$y = 2x$$

What is the solution of the system of equations shown above?

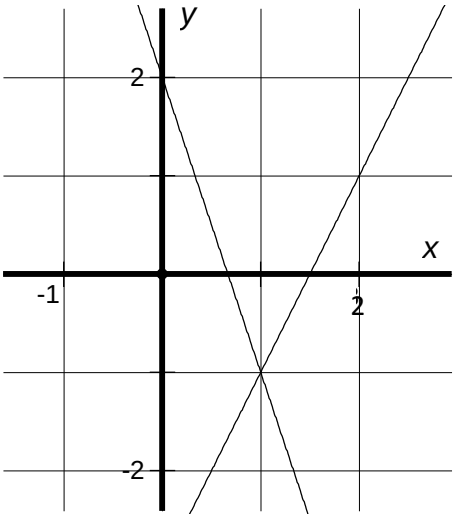
A. $(1, -2)$

B. $(1, \ 2)$

C. $(\ 5, \ 10)$

D. $(-5, -10)$

2) What is the solution for the system graphed below?



Write an equation for each line.

3) Solve by using substitution.

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

4) Solve.

$$6x - 2(x + 7) = 5x - 3$$

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Date: _____ Per: __

Group Quiz 1

Show ALL work and box final answers.

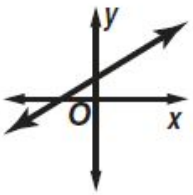
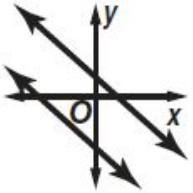
1a.) If a LinkBot's wheels are turning at a speed of 200 degrees per second for 10 seconds, how far will it travel (in inches)?

1b.) If a LinkBot's wheels are turning at a speed of 450 degrees per second for 8 seconds, how far will it travel (in inches)?

2a.) Suppose we need our Linkbot to travel exactly 70 inches in exactly 14 seconds. What speed will the robot have to travel in degrees per second to achieve this?

2b.) Suppose we need our Linkbot to travel exactly 55 inches in exactly 15 seconds. What speed will the robot have to travel in degrees per second to achieve this?

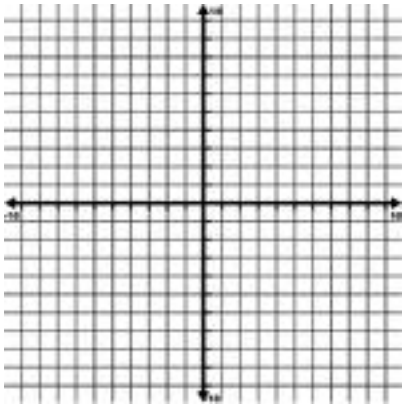
3.) How many solutions are shown in each graph below?

intersecting lines	same line	parallel lines
		

a.) _____ b.) _____ c.) _____

4.) Solve the following system of linear equations by graphing. ***State the number of solutions. If a solution does exists, indicate what it is.***

$y = 2x + 1$
$y = x - 4$



number of solutions: _____

solution (if any): _____

5.) Solve using substitution.

$y = 4x - 8$
$y = 2x + 2$

Linkbot Equation Verification

By this point we know that there is a relationship between degrees the wheels rotate and the distance the bot travels. We completed a linkbot motion worksheet and discovered that the relationship is 0.03 inches traveled for every one degree the wheel rotates.

Remember that this information helps us to calculate how far our bot will travel according to a specified number of degrees. We can use this math concept along with the speed of our robot to create linear equations for our bots.

Example:

A Linkbot named "Wild Bill" travels at a speed of 300 degrees per second. What is the function that models "Wild Bill's" speed?

Explanation:

We know that speed is a ratio that compares a distance with time. A speed ratio we hear often is miles per hour. Miles are a measure of distance and hours are a measure of time. 25 miles per hour would mean that the object would travel a total distance of 25 miles if it traveled at a constant rate of speed for 1 hour.

Since we know that "Wild Bill's" speed is constant, we should model his speed with a linear function. We are familiar with linear functions that are in slope-intercept form and look like $y = mx + b$ with m representing slope and b representing the y-intercept.

Answer:

We will start our answer with the basic form of a linear equation in slope-intercept form: $y = mx + b$ or $d = rt + b$ (distance equals rate times time plus a head start)

We are assuming that our distance units will be in inches and our time units will be in seconds. Therefore, x = time in seconds and y = distance in inches. The slope will need to be calculated and show the relationship or rate between inches and seconds. Our y-intercept will be 0 in this example because we are starting at zero distance traveled in zero seconds. So,
$y = mx$ or $d = rt$

Using the relationship of inches per degree, we take “Wild Bill’s” speed of 300 degrees per second and multiply by 0.03 to get 9 inches. Because “Wild Bill’s” speed was 300 degrees per second and we just converted to inches, we can say the speed is actually 9 inches per second. This makes our equation:
$y = 9x$ or $d = 9t$

1) Use the speed in degrees that you picked to calculate the slope of LinkBot 1 and write a linear equation that models its speed.

2) Does this equation match the equation you wrote from the data in part 1? If not, explain why you think there are differences.

3) Moving forward, are you going to use the equation you generated from the data or the equation you calculated? Why?

4) Use the speed in degrees that you picked to calculate the slope of LinkBot 2 and write a linear equation that models its speed.

5) Does this equation match the equation you wrote from the data in part 2? If not, explain why you think there are differences.

6) Moving forward, are you going to use the equation you generated from the data or the equation you calculated? Why?

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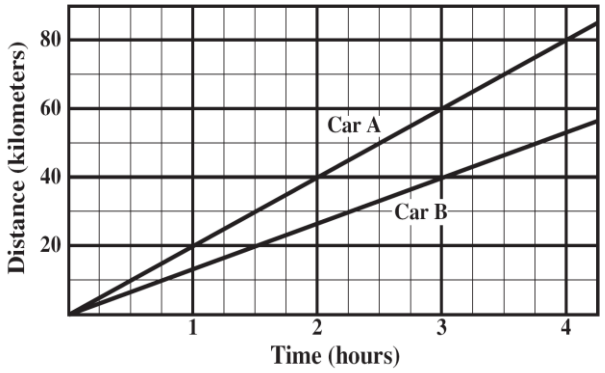
Do Now: Linear Systems 4

1)



After three hours of travel, Car A is about how many kilometers ahead of Car B?

A. 2

B. 20

C. 40

D. 60

2) Solve the system by graphing.

$$y = 2x$$

$$y = x + 2$$

Solution:_____

3) Solve for y.

$$x - 3y = 3$$

4) Solve.

$$3(x+2) < 5x - 14$$

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Linear Systems Review

Determine if the given ordered pair is a solution to the system.

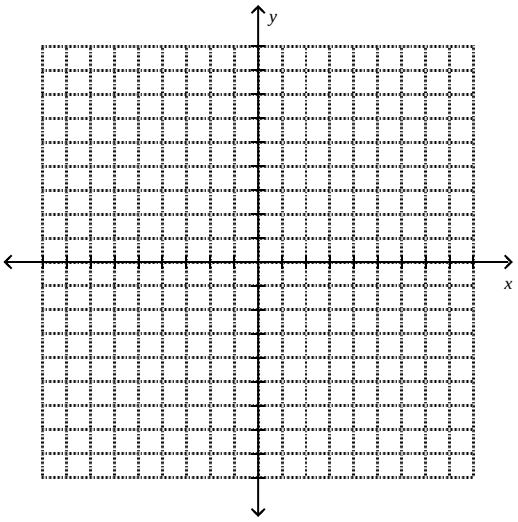
1) $\begin{cases} 3x - y = -5 \\ 2x + 3y = 4 \end{cases}$, $(-2,-1)$

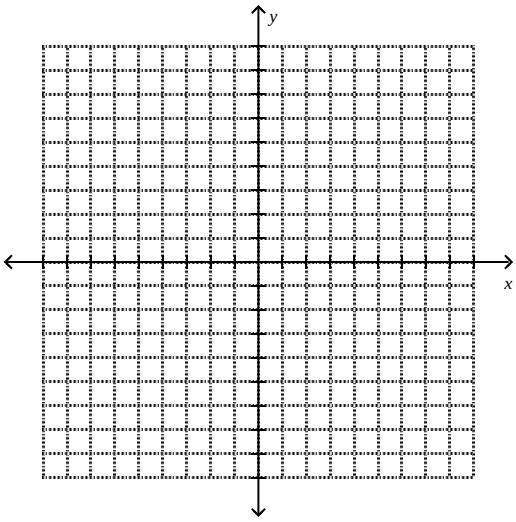
2) $\begin{cases} x - y = 2 \\ 2x + y = 4 \end{cases}$, $(2,0)$

Solve the following systems by graphing.

3) $\begin{cases} y = x + 1 \\ y = 2x - 2 \end{cases}$

4) $\begin{cases} 2x - y = 6 \\ y = -2x + 4 \end{cases}$





Solve using substitution.

5) $\begin{cases} y = x - 3 \\ y = -4x + 32 \end{cases}$

6) $\begin{cases} y = -2x + 1 \\ y = x - 2 \end{cases}$

7) $\begin{cases} y = -2x - 4 \\ y = -2x + 8 \end{cases}$

Race to Tie 2

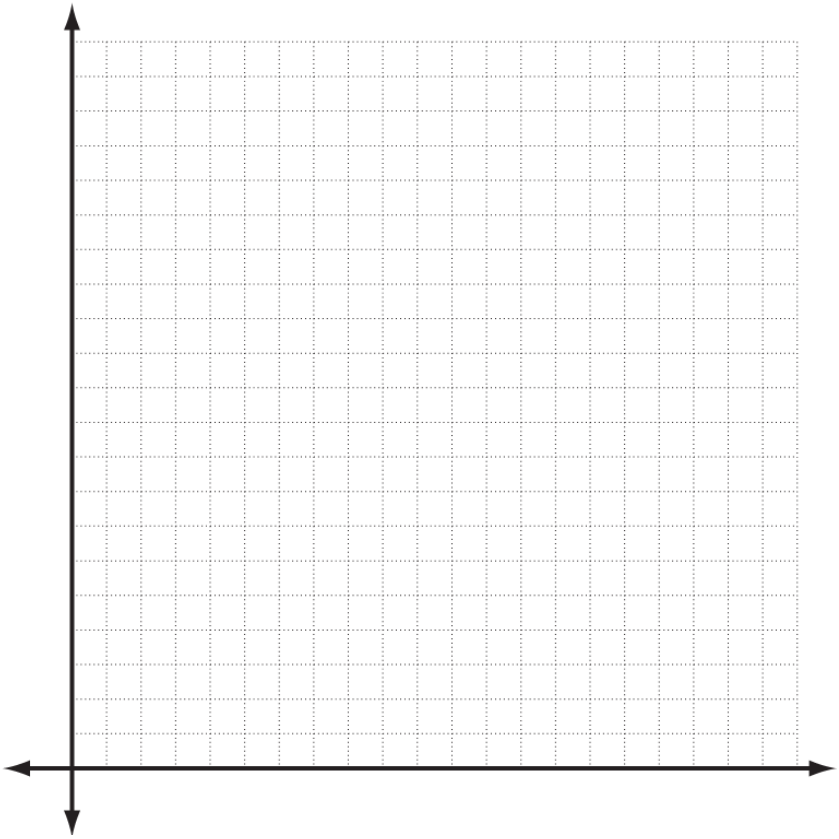
Part 3 – Linkbot Cars Together

1. The speed you picked for the LinkBot cars were: _____ & _____

The code for changing your Linkbot car's speed is:

robot.setJointSpeeds(*speed*, 0, *speed*)

2. Using a starting place of 10 inches for LinkBot car 1 and 40 inches for LinkBot car 2 along with the equations you determined in parts 1 and 2, graph lines for both bots.



3. Do the lines intersect? At what point do the lines intersect? What do the coordinates of these points represent? (Use complete sentences)

4. Write the final equations for each bot, making sure to include their starting points.

<u>LinkBot 1</u> <u>LinkBot 2</u>

5. Use the final equations to solve for the "tie point" Algebraically. Show all work and label each part.

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Do Now: Linear Systems 5

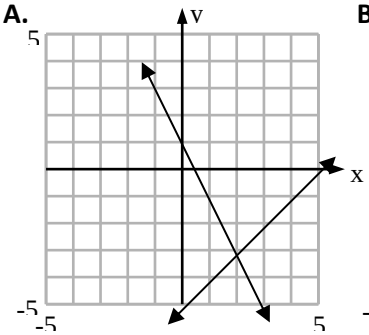
Multiple Choice

Identify the choice that best completes the statement or answers the question.

1. Solve the system by graphing.

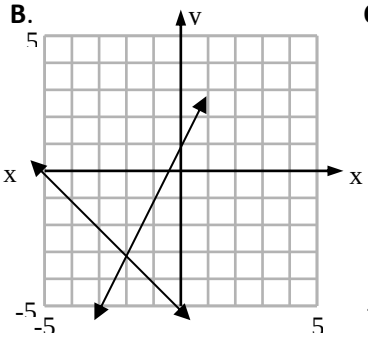
$-x+y=-5$
$2x+y=1$

A.



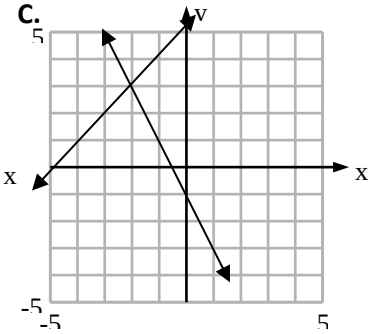
Solution: $(2,-3)$

B.



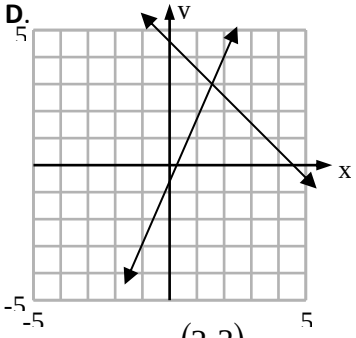
Solution: $(-2,-3)$

C.



Solution: $(-2,3)$

D.



Solution: $(2,3)$

2. Solve the system using substitution.

$y=-5x+12$
$3x+2y=3$

A. (1, 7) **B.** (2, 2) **C.** (3, -3) **D.** (1, 0)

3. Dave solved the following system using substitution. What is the first line in his solution that contains an error?

$4x-y=2$
$y=4x+2$

Dave's solution:

$4x-(4x+2)=2$	*Line* 1
$4x-4x-2=2$	*Line* 2
$x-2=2$	*Line* 3
$x=4$	*Line* 4
$y=4(4)+2$	*Line* 5
$y=18$	*Line* 6
Solution : $(-4, 18)$	

A. Line 1 **B.** Line 2 **C.** Line 3 **D.** Line 4

Race to Tie 2: Twists

Groups that finish early have the following twists available:

1) Keeping bot 1 at a 10 inches up the track, move bot 2 forward 10 inches to a start at 50 inches up the track. Will the bots take less or more time to tie? Make a prediction. Redesign your equations and calculate where the bots will tie. Once your calculations are complete, test your hypothesis. What happened?

2) Start both bots at 10 inches and 40 inches as they are in the original lab. Now the speed of bot 1 must be 4 times the speed of bot 2. Make a prediction about what you think will happen. Pick two speeds that satisfy the parameters and write the two linear equations that model the speeds and starting places of the bots (remember that the slope must be the speed in inches, not degrees). Calculate where the bots will tie and test the hypothesis. What happened?

3) Your bots need to tie at a point where the y-coordinate (distance in inches) is double your x-coordinate (time in seconds). The x-coordinate must be greater than 4 (the race must be longer than 4 seconds). Pick speeds and determine the linear equations for both bots such that they satisfy the parameters. Test your hypothesis for accuracy.

Solving Systems Recap/Practice

Lesson Summary

Systems of linear equations can be solved by eliminating one of the variables from the system. One way to eliminate a variable is by setting both equations equal to the same variable, then writing the expressions equal to one another.

Example: Solve the system $\begin{cases} y = 3x - 4 \\ y = 2x + 1 \end{cases}$

Since both equations of the system are equal to y, then we can write and solve the equation:

$$3x - 4 = 2x + 1$$

Another way to eliminate a variable is by multiplying each term of an equation by the same constant to make an equivalent equation. Then use the equivalent equation to eliminate one of the variables and solve the system.

Example: Solve the system $\begin{cases} 2x + y = 8 \\ x + y = 10 \end{cases}$

Multiply the second equation by -2 to eliminate the x:

$$-2(x + y = 10)$$
$$-2x - 2y = -20$$

Now we have the system $\begin{cases} 2x + y = 8 \\ -2x - 2y = -20 \end{cases}$

When the equations are added together, the x is eliminated:

$$2x + y - 2x - 2y = 8 + (-20)$$
$$y - 2y = 8 + (-20)$$

Once a solution has been found, verify the solution graphically or by substitution.

Problem Set

Determine the solution, if it exists, for each system of linear equations. Verify your solution on the coordinate plane.

1. $\begin{cases} \frac{1}{2}x + 5 = y \\ 2x + y = 1 \end{cases}$

2. $\begin{cases} 9x + 2y = 9 \\ -3x + y = 2 \end{cases}$

3. $\begin{cases} y = 2x - 2 \\ 2y = 4x - 4 \end{cases}$

4. $\begin{cases} 8x + 5y = 19 \\ -8x + y = -1 \end{cases}$

5. $\begin{cases} x + 3 = y \\ 3x + 4y = 7 \end{cases}$

6. $\begin{cases} y = 3x + 2 \\ 4y = 12 + 12x \end{cases}$

7. $\begin{cases} 4x - 3y = 16 \\ -2x + 4y = -2 \end{cases}$

8. $\begin{cases} 2x + 2y = 4 \\ 12 - 3x = 3y \end{cases}$

9. $\begin{cases} y = -2x + 6 \\ 3y = x - 3 \end{cases}$

10. $\begin{cases} y = 5x - 1 \\ 10x = 2y + 2 \end{cases}$

11. $\begin{cases} 3x - 5y = 17 \\ 6x + 5y = 10 \end{cases}$

12. $\begin{cases} y = \frac{4}{3}x - 9 \\ y = x + 3 \end{cases}$

13. $\begin{cases} 4x - 7y = 11 \\ x + 2y = 10 \end{cases}$

14. $\begin{cases} 21x + 14y = 7 \\ 12x + 8y = 16 \end{cases}$

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Do Now: Linear Systems 6

1) The perimeter of a rectangle is 32 inches. The length is 3 times the width.

If x = the width of the rectangle and y = the length, which linear system models the situation?

A. $\begin{cases} x + y = 32 \\ x = 3y \end{cases}$

C. $\begin{cases} 2x + 2y = 32 \\ x = 3y \end{cases}$

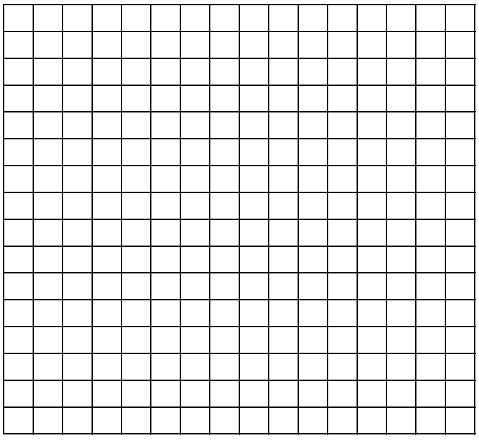
B. $\begin{cases} x + y = 32 \\ y = 3x \end{cases}$

D. $\begin{cases} 2x + 2y = 32 \\ y = 3x \end{cases}$

2) Solve by graphing.

$y = -3$

$2x + y = 1$



Solution:_____

3) Solve using substitution.

$y = -7$

$y = 3$

4) Solve using substitution.

$-x + 2y = -1$

$x = y + 4$

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Do Now: **Linear Systems 7**

1)

$$7x + 3y = -8$$
$$-4x - y = 6$$

What is the solution of the system of equations shown above?

A. $(2, 2)$

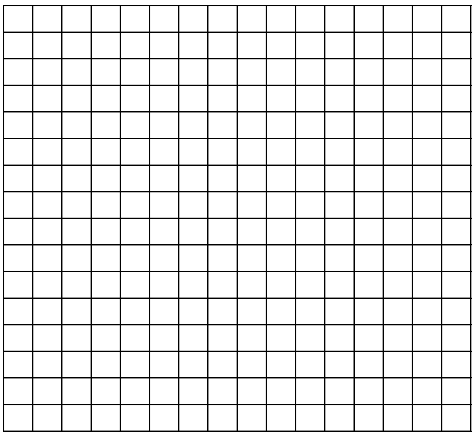
B. $(2, -2)$

C. $(-2, 2)$

D. $(-2, -2)$

2) Solve by graphing.

$$x + 3y = -3$$
$$x - y = 5$$



Solution:_____

3) Solve using substitution.

$$x + 3y = -3$$
$$x - y = 5$$

4) Solve using elimination.

$$x + 3y = -3$$
$$x - y = 5$$

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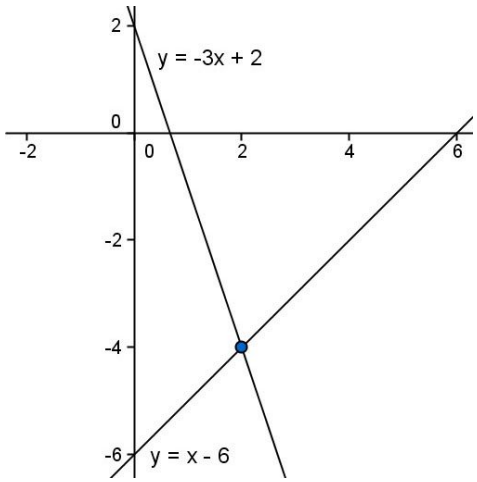
Group Quiz 2

Show ALL work and box final answers.

1) A tire with a 3.5 inch diameter rotates 650 degrees. How far has the tire traveled?

2) You have a linkbot wheel with a 12 inch circumference that must travel 19 inches. How many degrees do the wheels need to be programmed to spin?

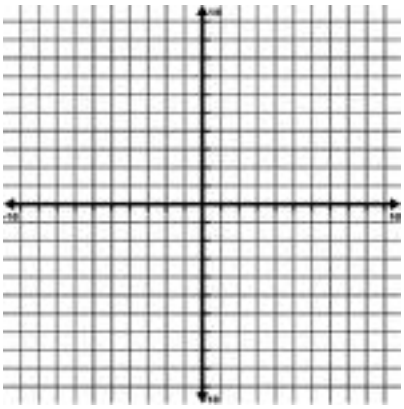
3) The following graph shows a linear system. Does the system have one solution, no solutions, or infinitely many solutions? If it has a solution, name it.



4) Solve the following system by graphing.

$y = -4x + 8$

$y = 3x + 1$



Solution: _____

5) Solve the following systems using substitution.

a) $y = 7x - 3$
$y = -x + 13$

b) $y = -6x - 3$
$-8x + 8y = 88$

6) Solve the following systems using elimination.

a) $4x + 8y = 20$
$-4x + 2y = -30$

b) $7x + 2y = 24$
$8x + 2y = 30$

c) $-4x + 9y = 9$
$x - 3y = -6$

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Unit Assessment

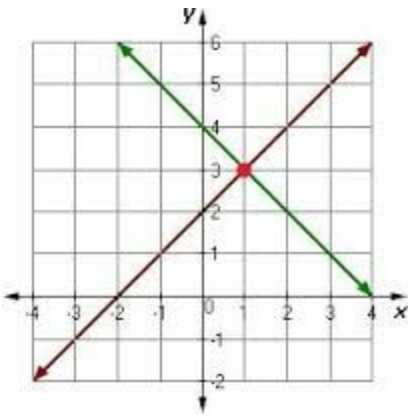
Show ALL work and box final answers. Round decimals to the nearest tenth.

1) A tire with a 3.2 inch diameter rotates 1,250 degrees. How far has the tire traveled?

2) You have a linkbot wheel with a 15 inch circumference that must travel 23 inches. How many degrees do the wheels need to be programmed to spin?

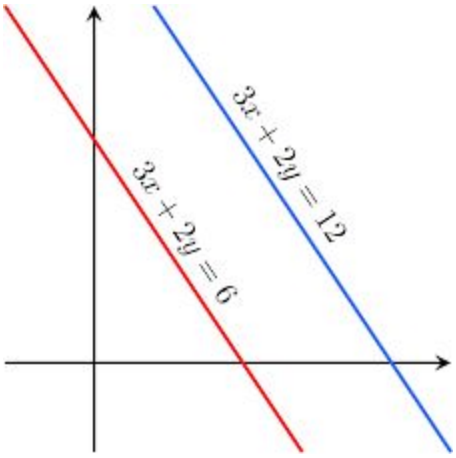
3) The following graph shows a linear system. Does the system have one solution, no solutions, or infinitely many solutions? If it has a solution, name it.

a.)



solution: _____

b.)

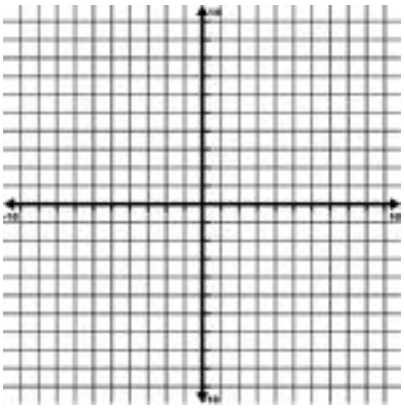


solution: _____

4) Solve the following system by graphing.

$y = -5x + 7$

$y = -4x + 5$



Solution: _____

5) Solve the following systems using substitution.

a) $y = 8x + 3$
$y = -x + 12$

b) $y = -5x + 1$
$7x - 7y = 77$

6) Solve the following systems using elimination.

a) $3x + 5y = 23$
$-3x + 2y = -37$

b) $-2x - 3y = 14$
$3x - 3y = 39$

c) $-8x + 28y = 40$
$4x + 8y = 24$