

SYSTEMS OF EQUATIONS

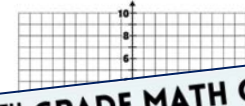
Name _____ Date _____

WARM UP #1

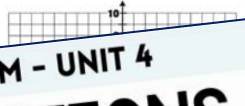
Lesson 3: Solving Systems by Elimination

Skill: Solving Linear Systems by Graphing

1) Solve the system by graphing:
 $-x + 2y = 3$
 $2x + y = 4$



2) Solve the system by graphing:
 $3x + y = -5$
 $y = -5$



8TH GRADE MATH CURRICULUM - UNIT 4

SYSTEMS OF EQUATIONS

Vocabulary

- Elimination
- Intersecting Lines
- Linear Equation
- Parallel
- Rate of Change
- Simultaneous Equations

Objectives

- Identify and contextualize slope and rate of change.

Performance Task

SOLVING LINEAR SYSTEMS

Dogs age faster than humans. Dog years are sometimes compared to human years to help us understand. Below are two models for comparing the age of dogs with the age of humans.

- Model 1:** Each dog year is equivalent to 7 human years.
- Model 2:** The first year of a dog's life is equivalent to 15 human years. The second year is equivalent to 9 human years. Each additional year is equivalent to 4 human years.

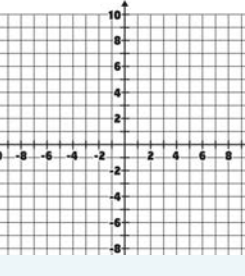
Name _____ Date _____

EXIT TICKET #1

Lesson 1: Introduction to Systems

Skill: Graphing and Solving Equations Review

1) Graph $-5x + y = 1$



2) Solve for x: $3 + 4(x - 2) = 12$

Name _____ Date _____

NOTES

SOLVING SYSTEMS BY GRAPHING

Vocabulary:

Rate of Change

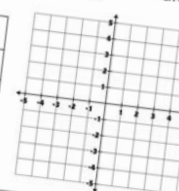
Slope Name _____ Date _____

COMPARING LINEAR FUNCTION

1) Harrison can purchase 4 DVDs for \$19.99 or 6 DVDs for \$22.50. Which is the better deal?

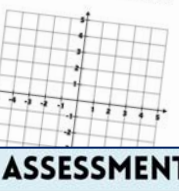
2) Circle the function with the greatest rate of change.

x	y
-2	-4
-1	-2
0	0
1	2



3) Circle the function with the smallest rate of change.

x	y
5	-1
4	-2
3	-3
2	-4



Name _____ Date _____

PERFORMANCE TASK

SOLVING LINEAR SYSTEMS

Dogs age faster than humans. Dog years are sometimes compared to human years to help us understand. Below are two models for comparing the age of dogs with the age of humans.

- Model 1:** Each dog year is equivalent to 7 human years.
- Model 2:** The first year of a dog's life is equivalent to 15 human years. The second year is equivalent to 9 human years. Each additional year is equivalent to 4 human years.

an years for each model.

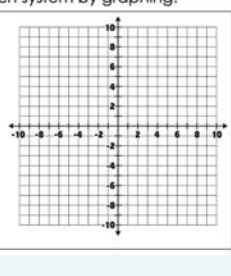
Name _____ Date _____

ASSESSMENT

SYSTEMS OF EQUATIONS

For #1 - 4: Solve each system by graphing.

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



2) $2x - y = 3$
 $3x + y = 4$



unit
4

SYSTEMS OF EQUATIONS

Vocabulary

- | | |
|--|---|
| <ul style="list-style-type: none"> • Elimination • Intersecting Lines • Linear Equation • Parallel • Rate of Change • Simultaneous Equations | <ul style="list-style-type: none"> • Slope • Substitution • Systems of Linear Equations • Unit Rate |
|--|---|

Objectives

- Identify and contextualize slope and rate of change from tables, graphs and equations in real-life situations.
- Identify, describe and graph functional relationships
- Solve problems involving linear relationships
- Model linear relationships in real-life situations
- Represent linear equations using words and tables.
- Solve problems involving linear relationships
- Represent linear equations using words, tables, and graphs.
- Understand and write equations in slope-intercept form.
- Represent linear equations using equations and graphs.
- Identify, write, and solve linear and functional relationships presented in real-life situations.

Standards

CCSS
8.EE.8

TEKS
8.9(A)

SYSTEMS OF EQUATIONS

Lesson	Resources
Unit Prep pages (3 – 10)	- Vocabulary Page - Warm Up Page - Unit Pre-Assessment
1) Introduction to Linear Systems pages (11 – 15)	- One Warm-Up - Writing Systems of Equations Notes - Writing Systems of Equations Introduction - One Exit Ticket
2) Solving Systems by Graphing pages (16 – 30)	- Three Warm-Ups - Solving Systems by Graphing Notes - Solving Systems by Graphing Fold and Flip Notes - Solving Systems by Graphing Practice - Solving Systems by Graphing Performance Task - Three Exit Tickets
3) Solving Systems by Elimination pages (31 – 42)	- Two Warm-Ups - Solving Systems by Elimination Notes - Solving Systems by Elimination Fold and Flip Notes - Solving Systems by Elimination Practice - Two Exit Tickets
4) Solving Systems with Substitution pages (43 – 54)	- Two Warm-Ups - Solving Systems by Substitution Notes - Solving Systems by Substitution Fold and Flip Notes - Solving Systems by Substitution Practice - Solving Linear Systems of Equations Quiz - Two Exit Tickets
5) Solutions to Systems pages (55 – 65)	- Two Warm-Ups - Solutions to Linear Systems Notes - Solutions to Linear Systems Fold and Flip Notes - Solutions to Linear Systems Practice - Two Exit Tickets
6) Linear System Applications pages (66 – 71)	- Two Warm-Ups - Linear System Applications Practice - Solving Linear Systems Performance Task - Two Exit Tickets
End of Unit pages (72 – 79)	- Review Sheet - Unit Post-Assessment (two versions, three pages each)

TEACHER RESOURCES

8TH GRADE MATH CURRICULUM - UNIT 4

SYSTEMS OF LINEAR EQUATIONS

DAY 1 TOPIC: Unit Prep RESOURCES: - Unit 3 Review Activity (teacher choice) - Unit 4 Pre-Assessment	DAY 2 TOPIC: Introduction to Linear Systems RESOURCES: - L1 Warm Up 1 - Writing Systems of Equations Notes - Writing Systems of Equations Introduction - Exit Ticket 1	DAY 3 TOPIC: Solving Systems by Graphing RESOURCES: - L2 Warm Up 1 - Solving Systems by Graphing Notes - Solving Systems by Graphing Fold and Flip Notes - Exit Ticket 1
DAY 4 TOPIC: Solving Systems by Graphing RESOURCES: - L2 Warm Up 2 - Solving Systems by Graphing Practice - Exit Ticket 2	DAY 5 TOPIC: Solving Systems by Graphing RESOURCES: - L2 Warm Up 3 - Solving Systems by Graphing Practice - Exit Ticket 3	DAY 6 TOPIC: Solving Systems by Elimination RESOURCES: - L3 Warm Up 1 - Solving Systems by Elimination Notes - Exit Ticket 1

- L2 Warm Up 2
- Solving Systems by Graphing Practice
- Exit Ticket 2

- L2 Warm Up 3
- Solving Systems by Graphing

- L3 Warm Up 1

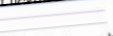
NOTES
 Date _____

WARM UP #1

Lesson 3: Solving Systems by Elimination

Skill: Solving Linear Systems by Graphing

1. Solve the system by graphing:
 $x + y = 3$
 $2x + y = 4$



SOLVING SYSTEMS BY GRAPHING

Vocabulary:

Date of Change:

Slope:

Visual Approach:
 The given equations are graphed to the right.
 $x + y = 3$ $x - y = 4$

1. What are the coordinates of the point of intersection?

2. Is it possible for two nonparallel lines to have no solution?

8TH GRADE MATH CURRICULUM

SYSTEMS OF EQUATIONS

EXIT TICKET #1

Lesson 1: Introduction to Systems

Skill: Graphing and Solving Equations Review

1) Graph $-3x + y = 5$

2) Solve for x : $3 + 4x = 12$

SOLVING LINE

Drag a page faster than humans. Drag words are sometimes understood. Below are two models for comparing the

UNIT VO

UNIT VOCABULARY

SYSTEMS OF EQUATIONS

Elimination	
Intersecting Lines	
Linear Equation	
Parallel	
Rate of Change	
Simultaneous Equations	
Slope	
Substitution	

8TH GRADE MATH CURRICULUM - UNIT 4

SYSTEMS OF EQUATIONS

Name	Pre-Assessment	Assessments	Notes



UNIT 4 LESSON 3

SOLVING

UNIT 4 LESSON 3

SOLVING SYSTEMS BY ELIMINATION

The collage features three distinct math-related items:

- Solving Systems by Elimination Student Tracking Sheet:** A large table with the title "Solving Systems by Elimination" at the top. The table has five columns: "Name", "Warm Up 1", "Warm Up 2", "Solving Systems by Elimination Notes", and "Solving Systems by Elimination Practice". The "Name" column is currently empty, while the other columns contain horizontal lines for writing.
- Unit 4 Systems Labels:** Three identical vertical labels are shown. Each label has a black circle at the top containing the word "unit" in a script font and the number "4" in a bold sans-serif font. Below the circle, the word "SYSTEMS" is written in a large, bold, sans-serif font.

SYSTEMS OF EQUATIONS

[illegible]

SOLVING SYSTEMS BY GRAPHING

2

Resource: 8th Unit 4, Lesson 2: Solving Systems by Graphing

Suggested Class Time: 3 days

The Big Idea

This is a complete lesson and practice for solving systems of equations by graphing. Students will:

- Learn that a solution to a system of linear equations can be found by graphing each equation and identifying the point of intersection.
- Learn the solution to a linear system is an ordered pair that satisfies both equations.

Standards

CCSS

- 8.EE.C.8: Analyze and solve pairs of simultaneous linear equations
 - A. Understand that a solution to a system of two linear equations in two variables correspond to points of intersection of their graphs, because points of intersection satisfy both equations simultaneously.
 - B. Solve systems of two linear equations simultaneously, estimate solutions by graphing the equations. Solve simple cases by inspection.
 - C. Solve real-world and mathematical problems leading to two linear equations in two variables.

Horizontal Planning

Pre-requisite Skills

- Solving and graphing equations

Current Skills:

TEKS

- 8.9(A): Identify and verify the values of x and y that simultaneously satisfy two linear equations in the form $y = mx + b$ from the intersections of the graphed equations.

WARM UPS AND EXIT TICKETS

Lesson 1: Introduction to Solving Systems

Skill: Writing and Solving Equations

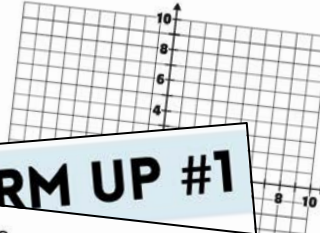
1) A bakery is selling baked goods. She sells x cookies for \$0.70 each and sells one cake for \$4.50. She makes a total of \$36.90. Write an equation to determine how many cookies she sold.

2) Ernest is also selling cupcakes for \$0.80 each. He sold 15 brownies. Determine how many cupcakes he sold.

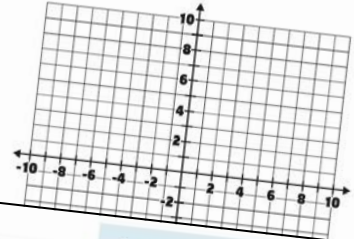
Lesson 2: Solving Systems by Graphing

Skill: Solving Linear Systems by Graphing

- 1) Solve the system by graphing:
- $$\begin{aligned} 2x + y &= 1 \\ x &= y + 1 \end{aligned}$$



- 2) Solve the system by graphing:
- $$\begin{aligned} 8x - 4y + 8 &= 0 \\ 6x + 3y + 6 &= 0 \end{aligned}$$



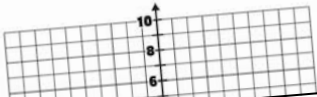
WARM UP #1

Lesson 3: Solving Systems by Graphing

Skill: Solving Linear Systems by Graphing

- 1) Solve the system by graphing:
- $$\begin{aligned} -x + 2y &= 3 \\ 2x + y &= 4 \end{aligned}$$

- 2) Solve the system by graphing:



Lesson 4: Solving Systems by Substitution

Skill: Solving Linear Systems by Substitution

- 1) Solve the system substitution.
- $$\begin{aligned} -x + 2y &= 3 \\ 2x + y &= 4 \end{aligned}$$

- 2) Solve the system substitution.
- $$\begin{aligned} 3x + y &= 15 \\ y &= -15 \end{aligned}$$

EXIT TICKET #1

Lesson 5: Solutions to Linear Systems

Skill: Number of Solutions

- 1) Identify the number of solutions to the system. If there is one solution, identify what it is.

$$\begin{aligned} 12x + 9y &= 6 \\ -6x + y &= 8 \end{aligned}$$

- 2) Identify the number of solutions to the system. If there is one solution, identify what it is.

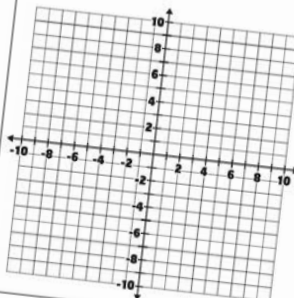
$$\begin{aligned} 2x + 2y &= -4 \\ 10x + 10y &= -20 \end{aligned}$$

Lesson 6: Linear System Application

Skill: Solving Linear Systems

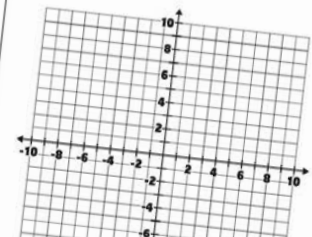
- 1) Solve the system using the method of your choice.

$$\begin{aligned} 3x + y &= 9 \\ 2x - y &= 6 \end{aligned}$$



- 2) Solve the system using the method of your choice.

$$\begin{aligned} 3x + y &= 3 \\ y &= 2x - 9 \end{aligned}$$



Lesson 5: Solutions to Linear Systems

Skill: Number of Solutions

- 1) Identify the number of solutions to the system. If there is one solution, identify what it is.

$$\begin{aligned} 7x + 6y &= 18 \\ 14x - 12y &= -22 \end{aligned}$$

NOTES

Name _____ Date _____

NOTES

WRITING SYSTEMS OF SOLVING SYSTEMS BY GRAPHING

NOTE

Vocabulary:

Linear Equation	
Systems of Linear Equations	

Background Knowledge:

Until this point, you've been writing and solving single equations. Now you will write and solve systems of two equations at the same time. Your goal? Find a single solution that satisfies both equations.

Write and solve equation for each situation.

Notes:

In this unit you will study systems of linear equations in two variables. Here are two equations that form a system of linear equations in two variables:

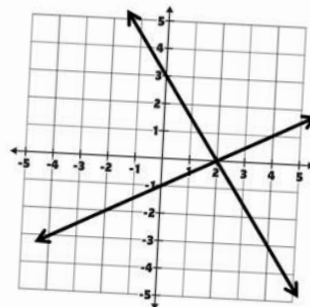
$$x + 2y = 5 \quad 2x - 3y = 3$$

The solution of a linear system is an ordered pair (x, y) that provides a solution to each equation in the system.

Examples:

The graph to the right shows the two equations below. Identify the solution of the system. Then check your solution algebraically.

$$3x + 2y = 6 \quad -x + 2y = -2$$



Name _____ Date _____

NOTES

SOLVING SYSTEMS BY ELIMINATION

Vocabulary:

Elimination	
-------------	--

Dependent Discovery:

Randy has some \$1 bills and \$5 bills in his wallet. He has 15 bills in all and the total value is \$47. How many of each type of bill does Randy have?

Let x represent the number of \$1 bills and y represent the number of \$5 bills. Write an algebraic model for this problem.

Name _____

Date _____

NOTE

SOLVING SYSTEMS BY SUBSTITUTION

Vocabulary:

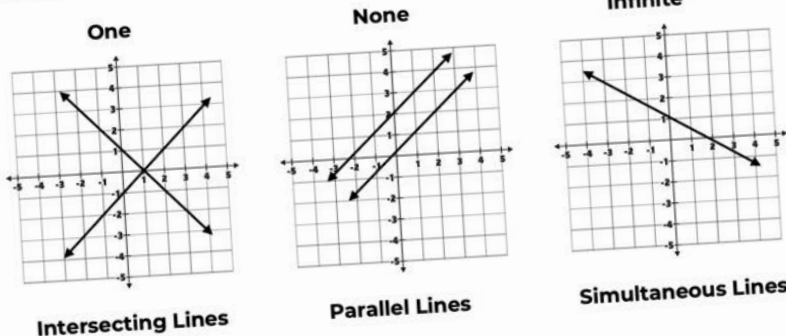
Substitution

SOLUTIONS TO LINEAR SYSTEMS

NOTES

At this point, each linear system in two variables had exactly one solution. The summary below shows there are two other possibilities.

Number of Solutions of a Linear System



Examples:

1) Explain why this linear system has no solution.

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

2) Explain why this linear system has infinitely many solutions.

$$-2x + y = 3$$

WRITE EACH EQUATION IN SLOPE-INTERCEPT FORM

GRAPH EACH EQUATION ON THE SAME COORDINATE PLANE

IDENTIFY THE POINT OF INTERSECTION

CHECK YOUR ANSWER

Solving Linear Systems

GRAPHING

SUBSTITUTION

ELIMINATION

Solutions to Linear Systems

ONE SOLUTION

NO SOLUTION

INFINITE SOLUTIONS

SOLVING SYSTEMS BY ELIMINATION

- 1 Standard Form
- 2 Multiply or Divide
- 3 Subtract
- 4 Substitute
- 5 Check!

PRACTICE WORKSHEETS

WRITING SYSTEMS OF EQUATIONS

James found two parking deals near the football stadium. In stadium Lot B it costs \$4 for each hour. A gas station across the street charges \$35 to park plus an additional \$2 for each hour.

Explore: For how many hours of parking will James pay the same amount of money at either location? How much will he pay at this time? Explain how you determined your answer.

2. If James knows he will only be staying for 3 hours, where should he park in order to pay the least amount of money? Explain how you determined your answer.

3. The game this week is a playoff game and James knows he will be there for 4 hours. Should he park in order to pay the least amount of money? Explain how you determined your answer.

SOLVING SYSTEMS BY ELIMINATION

Directions: Solve each system of equation using elimination. Show your work and your check.

System	Work it Out	Check it
1) $3x + y = 6$ $3x - 2y = 9$		

SOLVING SYSTEMS BY SUBSTITUTION

Directions: Solve each system of equation using substitution. Show your work and your check.

System	Work it Out	Check it
1) $-5x + y = -3$ $3x - 8y = 24$		
2) $y = 2x + 3$ $y = 4x - 1$		

SOLVING SYSTEMS BY GRAPHING

Directions: Solve each system of equation by graphing. Show your work and your check.

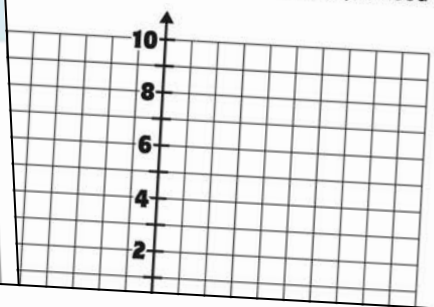
System	Graph it	Check it
1) $x + y = 5$ $x - y = 1$		
2) $4x + 2y = 6$		

GRAPHING LINEAR SYSTEMS

A new zookeeper is trying to figure out a way to get the animals in their nighttime cages. He needs to be sure gates are closed along the way so certain animals do not cross paths! He has three different paths marked out already:

- Tigers (Blue Path): $x - 3y = -15$
- Rhinos (Green Path): $4x - y = 7$
- Giraffes (Orange Path): $2x + y = -1$

The path the zookeeper (purple path) will travel to close the gates will be along this path: $x + y = -5$
Using colored pencils and the graph below, determine where you need to put the gates.



LINEAR SYSTEM APPLICATIONS

Directions: Read each situation carefully. Write and solve a linear system to find each answer.

1) Ava and Addison are saving for a new cell phone. Ava is starting with \$100 and adding \$5 each week. Addison is starting with \$200 and adding \$4 each week. Write and solve a system that can be used to find out after how many weeks Ava and Addison will have the same amount of money saved.

Ordered pair solution: _____
of weeks: _____
Amount saved: \$ _____

2) Jorge has only dimes and nickels in his piggy bank. He has a total of 77 coins. The value of the coins is \$6.95. Write and solve a system that can be used to determine how many dimes and how many nickels he has.

ASSESSMENTS - PRINT AND DIGITAL

Name _____ Date _____ Class _____

PRE-ASSESSMENT

For #1 - 3: Solve each equation. Show work when needed.

1) $5x - 3 = 2x + 9$ 2) $16 = 4 - 2(x + 2)$ 3) $2x -$

$x =$ _____ $x =$ _____

For #4 - 6: Simplify each expression. Show work when needed.

4) $y = 4x - 2$ if $y = 2x + 6$ 5) $(8x - 3y) + (9x - y)$ 6) $2 +$

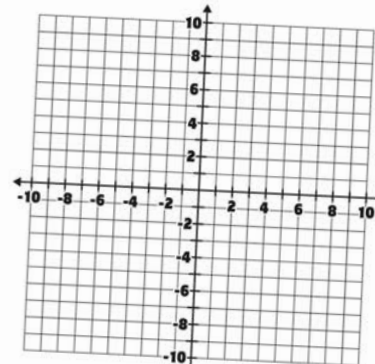
QUIZ SOLVING LINEAR SYSTEMS OF EQUATIONS

Directions: Solve each linear system using the given method. Show all work.

1. Solve the linear system by graphing. Show your check.

$$x - 2y = 12$$

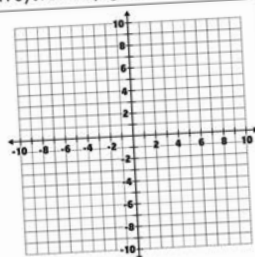
$$-3x + y = -1$$



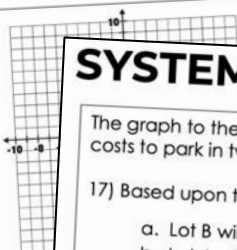
ASSESSMENT SYSTEMS OF EQUATIONS

For #1 - 2: Solve each system by graphing.

1) $y = x - 7$
 $3x + y = 1$



2) $2x + y = -15$
 $y = 5x + 6$



For #3 - 5: Solve each system using substitution.

3) $0.2x + y = -1.8$

4) $y = 2x - 7$
 $x + 2y = 1$

5) $4x -$

ASSESSMENT SYSTEMS OF EQUATIONS

For #10 - 12: Identify the number of solutions to each set of systems.

10) $15x - 3y = 12$
 $y = 5x - 4$

11) $4x - y = -4$
 $-8x + 2y = 2$

12) $y = -6x - 2$
 $12x + 2y = -6$

For #13 - 20: Read each problem carefully. Write and solve a system of equations to find the missing information.

13) April is buying fruit. Oranges cost \$2 per pound and grapes cost \$3 per pound. April spent a total of \$24 for 10 pounds fruit. Write and solve a system of equations to show how many pounds of oranges and how many pounds of grapes April bought.

14) A company sells regular phone prints are \$40 each. Jen spent equations to show how many

15) Rachel collects vintage dolls. \$120 on 6 dolls. Write and solve equations to show how many small dolls Rachel purchased

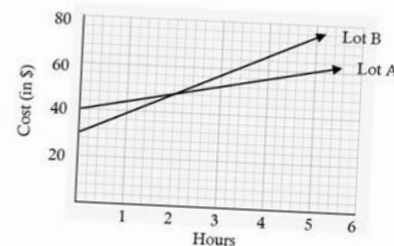
16) Luis is working at a restaurant. He is a pizza delivery driver. Write and solve a system of linear equations to make the same amount

ASSESSMENT SYSTEMS OF EQUATIONS

The graph to the right shows how much it costs to park in two different parking lots.

17) Based upon the graph, which statement is true?

- a. Lot B will always cost more than Lot A.
- b. Lot A will never cost more than Lot B.
- c. The cost of Lot B becomes greater than Lot A after 2 hours.
- d. The cost of Lot A becomes greater than Lot B after 2 hours.



Eric has \$750 saved and will save an additional \$1,200 saved and will save an additional \$20 a week. How many weeks will it take Eric to save the same amount of money?

Two moving trucks from the same company. They pay a fee of x dollars and y dollars for the miles they drive. Carl drives 150 miles and pays \$215. Lisa drives 200 miles and pays \$245. Write and solve a system of equations to find the fee and the cost per mile.



Unit 4 SYSTEMS OF LINEAR EQUATIONS ASSESSMENT

System of Linear Equations

lindsayperro@gmail.com Switch account

* Required

Email *

Your email

Solve each question by graphing

1) Select the graph that represents the system of equations: *



UNIT 4 QUIZ SOLVING LINEAR SYSTEMS

Solving Linear Systems of Equations Quiz

lindsayperro@gmail.com Switch account

* Required

Email *

Your email

1) Solve the linear system by graphing. Which graph is correct? *

$$x - 2y = 12 \text{ and } -3x + y = -1$$

