

TOPIC 5

Analyze and Solve System of Equations

In this topic, students learn about systems of linear equations, and how to solve them. A system of equations can be used to represent real-world situations and solve problems.

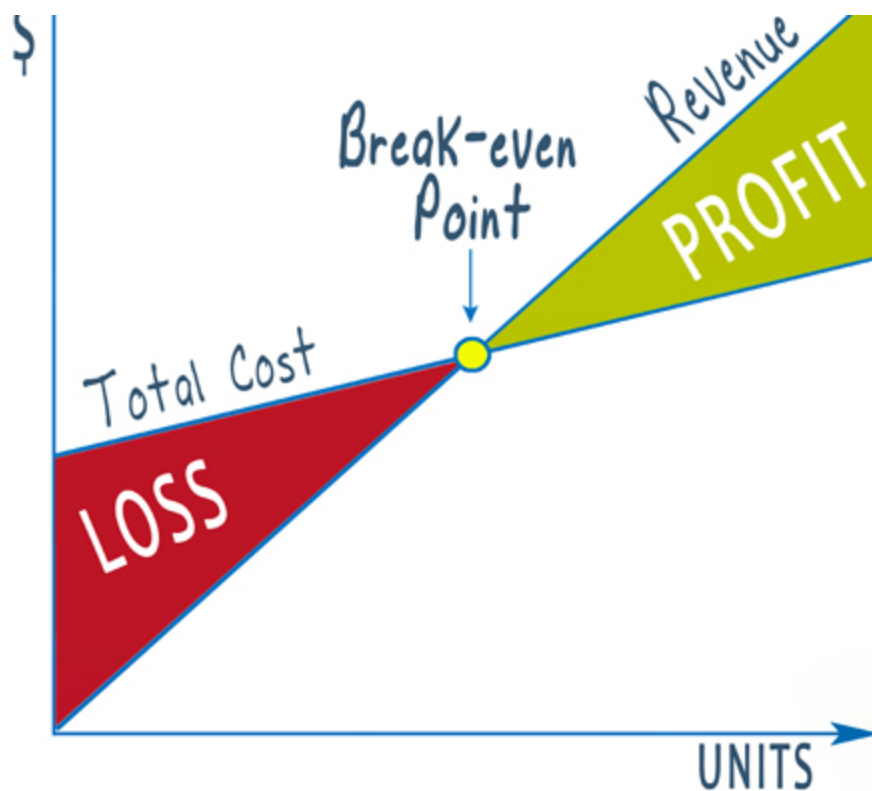
CONNECT THE MATH

Systems of equations are useful for modeling many different situations. When considering a financial decision, it can be helpful to model your options with a system of equations. The decisions you make are also impacted by your individual and specific needs.

When starting a small business, you can compare the cost of running your business to the revenue you expect to generate. The intersection point of the graph of the system represents the break-even point. Knowing when you will break even can help you make decisions about investing in your new business.

When comparing saving plans, a graph representing both plans will show how fast each plan accumulates value, if or when the plans will have the same value, and how long it will take you to reach your saving goal with each plan. The information the graph provides can help you decide which saving plans meets your personal needs and goals.





LESSON 5-1

Estimate Solutions by Inspection

A system of linear equations can have no solution, one solution, or infinitely many solutions. The number of solutions can be determined by comparing the slopes and y -intercepts of the equations or by identifying the number of intersection points using graphs of the lines.

LESSON OBJECTIVES

- Examine the graphs of a system of linear equations to determine the number of solutions of the system.
- Compare the equations in a linear system to determine the number of solutions of the system.

HOW CAN YOU HELP WITH HOMEWORK

Review Lesson Content

Watch and share these video tutorials with your student:

- [What's a Solution to a System of Linear Equations?](#)
- [How Do You Graph a System of Equations that Has No Solution?](#)

Review Key Vocabulary

Review key vocabulary from this lesson in your student's glossary:

- [solution of a system of linear equations](#)
- [system of linear equations](#)

You can use these search terms and phrases to help your student find additional help online:

- graphs of a system of linear equations
- a system of linear equations with one solution
- a system of linear equations with two solutions
- a system of linear equations with no solution
- identifying an ordered pair as a solution to a system of linear equations
- estimating a solution to a system of linear equations



LESSON 5-2

Solve Systems by Graphing

Systems of equations can have zero solutions, one solution, or infinitely many solutions. The solution to a linear system is the point or points at which the lines intersect.

LESSON OBJECTIVE

- Create and examine graphs of linear systems of equations to determine the solution.
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HOW CAN YOU HELP WITH HOMEWORK

Review Lesson Content

Watch and share these video tutorials with your student:

- [How Can You Tell When a System of Equations Has Infinitely Many Solutions?](#)
- [How Do You Solve a System of Equations by Graphing?](#)

You can use these search terms and phrases to help your student find additional help online:

- solving a system of linear equations by graphing
 - graphing a system of linear equations with no solution
 - graphing a system of linear equations with infinitely many solutions.
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LESSON 5-3

Solve Systems by Substitution

Substitution is a useful method for solving a system of linear equations. It is accomplished by rewriting one of the equations for one variable in terms of the other, substituting that expression into the other equation, and then solving.

LESSON OBJECTIVES

- Understand how substitution can be used to solve a linear system of

equations.

- Apply this understanding to interpret the results with one solution, no solutions, or infinitely many solutions.

HOW CAN YOU HELP WITH HOMEWORK

Review Lesson Content

Watch and share these video tutorials with your student:

- [How Do You Solve a System of Equations Using the Substitution Method?](#)
- [What is Another Way of Solving a System of Equations Using the Substitution Method?](#)

You can use these search terms and phrases to help your student find additional help online:

- using substitution to solve a system of equations with one solution
- using substitution to solve a system of equations with no solutions
- using substitution to solve a system of equations with infinitely many solutions

LESSON 5-4

Solve Systems by Elimination

Elimination can be used to solve a system of linear equations by adding or subtracting the equations to eliminate one variable, and use the resulting equation to find the other variable, or identify if there is no solution or an infinite number of solutions.

LESSON OBJECTIVES

- Understand how the process of elimination can be used to solve a system of linear equations with no solution, one solution, or infinitely many solutions.
 - Apply this understanding to solve mathematical and real-world problems.
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HOW CAN YOU HELP WITH HOMEWORK

Review Lesson Content

Watch and share these video tutorials with your student:

- [How Do You Solve a System of Equations Using the Elimination by Addition Method?](#)
- [How Do You Solve a System of Equations Using the Elimination by Multiplication Method?](#)

You can use these search terms and phrases to help your student find additional help online:

- solving a system of equations by adding
- solving a system of equations by subtracting
- solving a system of equations by multiplying