

Dear Family,

In this module, *Systems of Linear Equations*, students will draw on their prior knowledge of linear equations to solve systems of two linear equations both graphically and algebraically. As they explore **systems of equations**, they will understand what a **solution to a system of equations** is, and what it means for a system to have one solution, infinitely many solutions, or no solution.

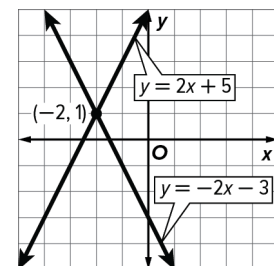
What Did Students Learn Previously?

In previous modules, students compared linear functions by examining their equations, function tables, and graphs. For example, students were shown book purchase fees associated with three different book clubs. The fee structures were represented in a different form for each club: one in a table, one by an equation, and the remaining by a graph. Students were asked to compare the cost to join and cost per book for each club using the three representations provided.

What Will Students Learn in This Module?

Solve a System of Equations by Graphing

- Students will learn that the **solution to a system** of two linear equations corresponds with the intersection of their graphs. In the graph shown, the solution is $x = -2$; $y = 1$.
- Students will verify a solution by evaluating it algebraically. The system $y = 2x + 5$ and $y = -2x - 3$ can be evaluated for the solution $x = -2$, $y = 1$, by replacing x with -2 and replacing y with 1 in each equation. Because $1 = 2(-2) + 5$ and $1 = -2(-2) - 3$, $(-2, 1)$ is the solution.



Identify the Number of Solutions

- Students will understand that a **system of equations** can have zero, one, or infinitely many solutions.
- Students will identify the number of solutions in a system from its graph. Students should recognize that a system of two parallel lines will have no solution because parallel lines never cross, and that a system of two coinciding lines will have infinitely many solutions because they have an infinite number of points in common.
- Students will identify the number of solutions in a system algebraically by examining the slope m and y -intercept b of each equation.

Solve Systems of Equations Algebraically

- Students will solve systems of equations using **substitution**.
- Students will solve systems of equations using **elimination**.

What Vocabulary Terms Will Students Use?

Term	Definition
elimination	An algebraic method that can be used to find the solution of a system of equations by combining the equations to eliminate one of the variables.
solution of a system of equations	An ordered pair whose values make both equations in the system true.
substitution	An algebraic model that can be used to find the solution of a system of equations by replacing one of the variables with either a value or an algebraic expression containing the other variable.
system of equations	A set of two or more equations with the same variables.

How You Can Provide Support

1. Support your child's understanding of systems of equations by engaging them in a coin challenge. Sort two types of coins. Tell your child how much money you have in these two types of coins and the total number of coins. Ask your child to determine how many of each type of coin you have.
For example, if you have 5 quarters and 3 dimes, tell your child that you have \$1.55 in quarters and dimes and a total of 8 coins. Use the following questions to guide your child.
 - Ask your child to define and name the variables. In the example given, q could represent the number of quarters, and d could represent the number of dimes.
 - Ask your child to write an equation to represent the number of coins. In the example given, your child could write $q + d = 8$.
 - Ask your child to write an equation to represent the amount of money. In the example given, your child could write $0.25q + 0.10d = 1.55$.
 - Ask your child to determine the number of quarters and the number of dimes you have.
2. Encourage your child to have a positive, growth-oriented attitude towards mathematics and their learning.
 - Encourage them to ask questions – both at home and in class. Sometimes, an answer to a question will generate more questions. That's how you know they are learning!
 - Encourage your child to embrace challenges and remind them that every challenge is an opportunity to learn something new.
 - Celebrate successes – both small and large.
3. Contact me to arrange a time to discuss the specifics of your child's performance and how we can work together to help them succeed in this module.

Sincerely,

(Teacher's Name)

(Email/Phone)