

Core Content

Cluster Title: Solve systems of equations.
Standard: A.REI.5 Prove that, given a system of two equations in two variables, replacing one equation by the sum of that equation and a multiple of the other produces a system with the same solutions.
Concepts and Skills to Master
<ul style="list-style-type: none"> ▪ Explain the use of the multiplication property of equality to solve a system of equations. ▪ Explain why the sum of two equations is justifiable in the solving of a system of equations. (Property of equality) ▪ Relate the process of linear combinations with the process of substitution for solving a system of linear equations.

Supports for Teachers

Critical Background Knowledge	
Graph a line, Solve systems of equations.	
Academic Vocabulary	
Elimination by multiplication and addition, substitution	
Suggested Instructional Strategies	Resources
<ul style="list-style-type: none"> ▪ Modeling with a balance scale –to make the point of the multiple of an equation for purposes of elimination in a system. 	
Sample Formative Assessment Tasks	
<p>Skill-based Task</p> <p>Verify that (-4,13) is the solution to the system.</p> $\begin{cases} 2x + y = 5 \\ -5x - 2y = -6 \end{cases}$ <p>Justify that the following is an equivalent system.</p> $\begin{cases} -3x - y = -1 \\ -5x - 2y = -6 \end{cases}$ <p>Verify that (-4,13) is the solution to this new system.</p>	<p>Problem Task</p> <p>Create a new system using both the addition and multiplication properties of equality. Then verify that the new system has the same solution as the original.</p> $\begin{cases} 2x + y = 5 \\ -5x - 2y = -6 \end{cases}$

Core Content

Cluster Title: Solve systems of equations.
Standard: A.REI.6 Solve systems of linear equations exactly and approximately (e.g., with graphs), focusing on pairs of linear equations in two variables.
Concepts and Skills to Master
<ul style="list-style-type: none"> ▪ Solve a system of equations exactly (with algebra) and approximately (with graphs). ▪ Test a solution to the system in both original equations (both graphically and algebraically). ▪ Analyze a system of equations using slope to predict one, infinitely many or no solutions.

Supports for Teachers

Critical Background Knowledge	
Graph a line, Find the slope of a line, Solve systems of equations	
Academic Vocabulary	
System of equations, consistent and inconsistent systems, dependent and independent systems, solution set	
Suggested Instructional Strategies	Resources
<ul style="list-style-type: none"> ▪ Solve contextual problems using systems of equations. ▪ Have students generate scenarios which might yield one, many, no solutions. ▪ Have students create systems of equations to model various contextual situations such as cell phone costs. ▪ Use graphing calculators to estimate solutions to systems. 	www.illuminations.NCTM.org Everything Balances Out in the End
Sample Formative Assessment Tasks	
Skill-based Task Approximate the solution to the system of equations graphically. Then verify the solution algebraically. $3x - 5y = -15$ $2x - y = 2$	Problem Task The high school is putting on the musical “Footloose”. The auditorium has 300 seats. Student tickets are \$3 and adult tickets are \$5. The royalty for the musical is \$1300. What combination of student and adult tickets do you need to fill the house and pay the royalty? How could you change the price of tickets so more students can go?