

Activity 3

Solving Systems of Equations: The Method of Elimination

Whenever a system of n equations with n unknowns is given there are several methods that can be used to find the solution to the system if a solution exists. In this activity, you will use the method of elimination to solve systems of equations.


Exploration

Using the elimination method, solve the system of equations:

$$5x - 3y + 4z = 19$$

$$3x + 5y - 4z = 7$$

$$-7x + 2y - 2z = -16$$

1. Open a new TI InterActive! document. Title this document **The Method of Elimination**. Add your name and the date.
2. Select Math Box  and define eq1: = $5x - 3y + 4z = 19$. Press Enter.

Note: Use the  key on the Math Palette to define a variable.

In two additional math boxes define eq2: = $3x + 5y - 4z = 7$ and eq3: = $-7x + 2y - 2z = -16$.

3. In a math box, define eq4 to be the equation that uses eq1 and eq2 to eliminate z .

Record your process and eq4. _____

4. In a math box, define eq5 to be the equation that uses eq1 and eq3 to eliminate z .

Record your process and eq5. _____

5. In a math box, define eq6 to be the equation that uses eq4 and eq5 to eliminate y .

Record your process and eq6. _____

6. On the Math Palette, select **Math►Algebra►Solve** and type (**eq6,x**). In the next math box, define x to be the value that you obtained using **solve**.

Record this x value. _____

7. Solve eq4 or eq5 for y as was done in question. In the next math box, define y using this result.

Record this y value. _____

8. Solve eq1, eq2, or eq3 for z as was done in question 6. In a math box, define z to be this value.

Record this z value. _____

9. In the next math box, enter $5x - 3y + 4z$.

Record your results. _____

10. In the next math box, enter $3x + 5y - 4z$.

Record your results. _____

11. In the next math box, enter $-7x + 2y - 2z$.

Record your results. _____

12. What is the solution to this system? Do steps 9 through 11 verify your solution?

Explain. _____

13. Save this document as **elimination.tii**. Print a copy of this document.

Additional Exercises

Solve each of the following systems of equations using the elimination method. Record your process as well as the solutions. Between each system, insert a math section break to begin a new problem.

1. $3x + 2y - 5z = 2$

$2x - 3y - 2z = 14$

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

Process

Solution

eq4: = _____ x: = _____

eq5: = _____ y: = _____

eq6: = _____ z: = _____

2. $x + 2y - 3z = -5$

$5x - 6y + 18z = -11$

$-3x + 2y + 3z = 15$

Process

Solution

eq4: = _____ x: = _____

eq5: = _____ y: = _____

eq6: = _____ z: = _____

3. $5x + 2y - z = 5$

$3x + 3y - 4z = 7$

$4x + 5y - 9z = 8$

Process

Solution

eq4: = _____ x: = _____

eq5: = _____ y: = _____

eq6: = _____ z: = _____

4. $3x + 2y + 9z = 17$

$-2x + 6y + 2z = -6$

$x - 5y - 3z = 1$

Process

Solution

eq4: = _____ x: = _____

eq5: = _____ y: = _____

eq6: = _____ z: = _____

5. $6x + 2y - z = 8$

$2x - 5y + 4z = 10$

$x - y + z = 11$

Process

Solution

eq4: = _____ x: = _____

eq5: = _____ y: = _____

eq6: = _____ z: = _____

6. $5x - y + 3z = 8$

$2x - 3y + z = 5$

$3x + 2y - 6z = 10$

Process

Solution

eq4: = _____ x: = _____

eq5: = _____ y: = _____

eq6: = _____ z: = _____