

Algebra RH

Essential Question: Is there another algebraic method to solve linear systems algebraically?

Do Now: Use the substitution method to solve the following linear system. *Don't forget to check your solution with both equations.*

$$4x + 3y = 16$$

$$2x - 3y = 8$$

Solving Linear Systems using the Elimination Method

1. $4x + 3y = 16$
 $2x - 3y = 8$

2. $3n + m = 2$
 $m + 3 = 2n$

3. $v - w = -5$
 $v + 2w = 4$

4. $y = x - 14$
 $-x + 8y = 0$



Can the following system of equations be solved by using elimination?

$$2x + 6y = 4$$

$$6x + 14y = 12$$

Procedure for Solving a Linear System using the Elimination Method

Step 1: Arrange the equations so that like terms line up in columns.

Step 2: Decide which variable to eliminate. Look for additive inverse coefficients. (If necessary, multiply one or both of the equations by a number resulting in opposite variable terms).

Step 3: Add the equations and solve for the variable (*Remember: only one variable should be present in the equation*).

Step 4: Substitute the value obtained in step 3 into either of the original equations in order to solve for the other variable.

Step 5: Check the solution in each of the original equations.

More Examples: Solve the linear system using the elimination method.

$$\begin{array}{l} 5. \quad 3x + 5y = 6 \\ \quad -4x + 2y = 5 \end{array}$$

$$\begin{array}{l} 6. \quad x + y = 12 \\ \quad -3y = 4x - 10 \end{array}$$

Solve the following systems algebraically using the elimination method. Check your solution.

1. $a + b = 5$
 $a - b = 7$

2. $3a - 5b = 31$
 $7a - 5b = 59$

3. $6p - 7q = 28$
 $-6p + 3q = -12$

4. $4a - 7b = 13$
 $2a - 7b = 3$

5. $3c - 8d = 7$
 $c + 2d = -7$

6. $x + y = 7$
 $3x - 2y = 11$

7. $2n + 5a = 14$
 $6n + 7a = 10$

8. $3t - 8z = 34$
 $7t + 4z = -34$

9. $4r + 9s = 23$
 $-7r + 3s = -34$

10. $18a - 5b = 17$
 $6a + 10b = -6$