

# Solving Systems by Elimination Method

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## PRE-CALCULUS 11 INEQUALITIES & SYSTEMS OF EQUATIONS SOLVING SYSTEMS BY ELIMINATION METHOD

### A. Definitions

1. **linear system:** a set of equations where all equations are linear.
2. **solving a system:** determining the coordinates of the point of intersection.

### B. Elimination Method

#### **Rules**

1. Add or subtract the equations together to eliminate one of the variables. You may multiply the equations by a constant if necessary.
2. Solve for one of the variables.
3. Take the answer for one variable and substitute to find the remaining variable answer.

Solve the following linear system.

$$\begin{array}{r} \text{Addition} \\ 1) \quad \begin{array}{r} \downarrow \quad \downarrow \quad \downarrow \\ 3x - 5y = -9 \\ + 4x + 5y = 23 \\ \hline 7x = 14 \\ \hline x = 2 \end{array} \end{array}$$

$$\begin{array}{r} 4x + 5y = 23 \\ 4(2) + 5y = 23 \\ \cancel{8} + 5y = \cancel{23} - 8 \\ \hline 5y = 15 \\ \hline y = 3 \end{array}$$

Solution (2, 3)



$$5) \begin{cases} \frac{1}{2}x - \frac{2}{3}y = 6 \\ \frac{1}{4}x + \frac{1}{3}y = -1 \end{cases}$$

Addition

$$\begin{array}{r} 3x - 4y = 36 \\ + 3x + 4y = -12 \\ \hline \end{array}$$

$$\frac{6x}{6} = \frac{24}{6}$$

$$\underline{\underline{x = 4}}$$

$$\frac{1}{2}x - \frac{2}{3}y = 6$$

$$\frac{1}{2}(4) - \frac{2}{3}y = 6$$

$$2 - \frac{2}{3}y = 6$$

$$-\frac{2}{3}y = 4 \div -\frac{2}{3}$$

$$\underline{\underline{y = -6}}$$

$$\boxed{\text{Solution } (4, -6)}$$

Assignment: Solving Linear Systems by Elimination Assignment #1 - 12

PRE-CALCULUS 11  
INEQUALITIES & SYSTEMS OF EQUATIONS  
SOLVING SYSTEMS BY ELIMINATION ASSIGNMENT

Solve the following systems of equations.

1)  $x + 2y = 3$   
 $-x + 3y = 2$

2)  $2x + 5y = 16$   
 $x - y = 1$

3)  $4x - 3y = 9$   
 $2x - 5y = 1$

4)  $2x + 4y = 7$   
 $4x - 3y = 3$

5)  $2x + 3y = 18$   
 $2x - 3y = -6$

6)  $3x + 5y = 4$   
 $3x + 2y = 7$

7)  $8x - 3y = 38$   
 $4x - 5y = 26$

8)  $3x + 4y = 18$   
 $2x - 3y = -5$

9)  $6x - 2y = 21$   
 $4x + 3y = 1$

10)  $7x + 6y = 2$   
 $x + 8y = -4$

11)  $8x - y = 16$   
 $2x - 3y = 2$

12)  $y + 2x = 10 + 4y$   
 $4(x + y) = 42 - y$

Answers

1) (1,1)

2) (3,2)

3) (3,1)

4)  $\left(\frac{3}{2}, 1\right)$

5) (3,4)

6) (3,-1)

7) (4,-2)

8) (2,3)

9)  $\left(\frac{5}{2}, -3\right)$

10)  $\left(\frac{4}{5}, -\frac{3}{5}\right)$

11)  $\left(\frac{23}{11}, \frac{8}{11}\right)$

12) (8,2)