

C5 - Solving Algebraically (Elimination)

✓ Use elimination method to solve a system of linear equations

Warm Up - Board Work

Use the substitution method to solve the following System of Linear Equations.

$$\begin{array}{r} x + y = 10 \\ + 2x + y = 2 \\ \hline 3x = 12 \\ \boxed{x = 4} \end{array}$$

← I'll try elimination method later.

$$\begin{array}{l} x + y = 10 \\ (4) + y = 10 \\ \boxed{y = 6} \end{array}$$

Elimination Example #1

Solve the following system using elimination. Verify your solution.

$$\begin{array}{r} 2x + 3y = 18 \\ - 2x - 5y = 2 \\ \hline 8y = 16 \end{array}$$

$$y = 2$$

$$2x + 3y = 18$$

$$2x + 3(2) = 18$$

$$2x + 6 = 18$$

$$2x = 12$$

$$x = 6$$

$$2x + 3y = 18$$

$$2(6) + 3(2) = 18$$

$$12 + 6 = 18$$

$$18 = 18$$

$$LS = RS \checkmark$$

$$2x - 5y = 2$$

$$2(6) - 5(2) = 2$$

$$12 - 10 = 2$$

$$2 = 2$$

$$LS = RS \checkmark$$

Elimination Example #2

Solve the following system using elimination. Verify your solution.

$$\begin{array}{r} 2(6a + 5b = 24) \\ 3(4a + 3b = 12) \end{array}$$

$$\begin{array}{r} 12a + 10b = 48 \\ - 12a + 9b = 36 \\ \hline \end{array}$$

$$b = 12$$

$$4a + 3b = 12$$

$$4a + 3(12) = 12$$

$$4a + 36 = 12$$

$$4a = -24$$

$$a = -6$$

$$6a + 5b = 24$$

$$6(-6) + 5(12) = 24$$

$$-36 + 60 = 24$$

$$24 = 24$$

$$LS = RS \checkmark$$

$$4a + 3b = 12$$

$$4(-6) + 3(12) = 12$$

$$-24 + 36 = 12$$

$$12 = 12$$

$$LS = RS \checkmark$$

Elimination Practice

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Elimination Example #3

Solve the following system using elimination. Verify your solution.

$$\textcircled{1} \quad 6 \left(2 - \frac{y}{2} = \frac{x}{3} \right)$$

$$\textcircled{2} \quad 2x - 3y = 6$$

$$12 - 3y = 2x$$

$$\textcircled{1} \quad 12 = 2x + 3y$$

$$- \textcircled{2} \quad \underline{6 = 2x - 3y}$$

$$6 = 6y$$

$$y = 1$$

$$2x - 3y = 6$$

$$2x - 3(1) = 6$$

$$2x - 3 = 6$$

$$2x = 9$$

$$x = \frac{9}{2}$$

Elimination Practice

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