8 3 systems of linear equations solving by substitution

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How to Solve Systems of Linear Equations by Substitution

What is the Substitution Method?

The substitution method involves isolating one variable in one equation, then substituting that expression into the other equation to eliminate the variable.

How to Solve Systems by Substitution (Grade 8)

1. **Solve for one variable in one equation.** Choose the variable that is easier to isolate.
2. **Substitute the expression into the other equation.** Replace the variable with the expression you isolated in step 1.
3. **Solve for the remaining variable.** Isolate the remaining variable in the substituted equation.
4. **Substitute the value back into the original equation.** Replace the remaining variable with the value you found in step 3 to solve for the other variable.

How to Solve for 3 Variables Using Substitution

1. Solve for one variable in one equation as in Grade 8.
2. Substitute the expression into the other two equations.
3. Solve for the remaining two variables in the substituted equations.

4. Substitute the values back into the original equations to solve for the third variable.

Substitution Formula for Systems of Equations

Substitute formula: $$y = mx + b$$

where:

- **m** is the slope
- **b** is the y-intercept

Example of Substitution

Solve the system of equations:

- $x + y = 5$
- $x - y = 1$

Example with Substitution

Solve the equation: $5x + 2y = 20$

Substitution in Math

Substituting means replacing one expression or variable with another.

Solving Linear Equations

Linear equations have the form: $$ax + b = c$$

How to Solve a System of Equations

There are three methods for solving systems of equations:

- Substitution
- Elimination
- Matrices

How to Use Substitution Method for Simultaneous Equations

Follow the steps for substitution as outlined above.

Why Use Substitution Method?

Substitution is useful when:

- One variable is easily isolated.
- The equations are relatively simple.

Substitution Examples

- Substitute y = 2x into the equation 3x + y = 10 to solve for x.
- Substitute 2x + 3y = 7 into the equation 5x - y = 1 to solve the system.

Substitution Method Examples

- Solve the system: $$y = 2x - 1$$ $$x + y = 7$$

- Solve the equation: $$3(2x - 1) - 2y = 7$$

Solving 3 Linear Equations with 3 Unknowns

Follow the same steps for substitution as with 2 variables, but substitute into all three equations.

System of Linear Equations in Two Variables

A system of two linear equations has the form:

- $$ax + by = c$$
- $$dx + ey = f$$

Formula of Linear Equations Grade 8

The formula of a linear equation in slope-intercept form: $$y = mx + b$$

System of Linear Equations Class 8

A system of linear equations in Class 8 involves two linear equations with two variables.

Solving by Substitution

Follow the steps for substitution as outlined above.

Substitute a 3 Equation

Substitute the expression for one variable into all three equations.

Substitution for y mx b

Substitute $y = mx + b$ into another equation to solve for x or m.

Solve Simultaneous Linear Equation by Substitution Method

Follow the steps for substitution as outlined above to solve simultaneous equations.

Solve Systems by Substitution When Both Equations Equal y

Set the two equations equal to each other and solve for x. Then substitute x back into one of the equations to solve for y.

Solve a System of Inequalities Using Substitution

Substitute one inequality into the other inequality to create an equivalent system of inequalities.

Solve for b with Slope

Substitute the slope and one point into the equation $y = mx + b$ to solve for b.

Substitution with 2 y + mx + b Equations

Substitute $y = mx + b$ into the other equation to solve for x.

Substitute the y-Intercept

Substitute b (the y-intercept) into the equation $y = mx + b$ to solve for x or m.

Solve a Linear Equation by Substitution

Isolating one variable in one equation and substituting the expression into the other equation.

Solve a 3 Simultaneous Equation

Follow the steps for substitution, substituting into all three equations and solving for each variable.

3 Methods of Simultaneous Linear Equation

- Substitution
- Elimination
- Matrices

Substitution or Elimination Faster

Substitution is generally faster when one variable is easily isolated.

Easier Method: Substitution or Elimination

Substitution is often considered easier than elimination when the equations are relatively simple.

Solving a System of Equations by Substitution Test

Substitute one variable into the other equation and check if the resulting equation is true.

4 Methods of Solving Linear Equations in Two Variables

- Substitution
- Elimination
- Graphing
- Matrices

Example of a System of Linear Equations

$$2x + 3y = 10$$ $$x - y = 1$$

System of Two Linear Equations

A system of two linear equations involves two linear equations with two variables.

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