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Solving Systems Of Equations By Substitution Worksheet Answer Key PDF

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Part 1: Building a Foundation

What is a system of equations?

undefined. A) A single equation with multiple variables

undefined. B) A set of equations with the same variables ✓

undefined. C) A mathematical operation involving addition

undefined. D) A graphical representation of data

A system of equations is a set of equations with the same variables.

Which of the following are steps in the substitution method? (Select all that apply)

undefined. A) Solve one equation for one variable ✓

undefined. B) Graph the equations

undefined. C) Substitute the expression into the other equation ✓

undefined. D) Check the solution by substituting back into the original equations ✓

The steps include solving one equation for one variable, substituting the expression into the other equation, and checking the solution.

Explain why checking the solution is an important step in solving systems of equations by substitution.

Checking the solution ensures that the values satisfy both equations, confirming the accuracy of the solution.

List the three types of solutions that a system of equations can have.

1. Type 1

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Unique solution

2. Type 2

No solution

3. Type 3

Infinitely many solutions

The three types of solutions are: unique solution, no solution, and infinitely many solutions.

What does it mean if a system of equations has no solution?

undefined. A) The equations intersect at one point

undefined. B) The equations are parallel and never intersect ✓

undefined. C) The equations represent the same line

undefined. D) The equations have multiple intersection points

If a system has no solution, it means the equations are parallel and never intersect.

Part 2: comprehension and Application

Which step is crucial to ensure that the substitution method is correctly applied?

undefined. A) Solving both equations simultaneously

undefined. B) Solving one equation for one variable ✓

undefined. C) Graph the equations first

undefined. D) Using only one equation

The crucial step is solving one equation for one variable.

What can be inferred if substituting the expression results in a true statement like 0 = 0? (Select all that apply)

undefined. A) The system has no solution

undefined. B) The system has infinitely many solutions ✓

undefined. C) The equations are identical ✓

undefined. D) The system has a unique solution

If substituting results in a true statement like 0 = 0, it indicates that the system has infinitely many solutions.

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Describe how the graphical representation of a system with infinite solutions would look.

The graphical representation would show two lines that overlap completely, indicating they are the same line.

Solve the following system of equations using the substitution method: y = 3x + 2 2x + y = 10

To solve, substitute y = 3x + 2 into 2x + y = 10 and solve for x, then find y.

Given the system of equations below, identify the expression for substitution and solve for the variables: x = y - 4 3x + 2y = 12

1. Expression for substitution

x = y - 4

2. Value of y

y = 8

3. Value of x

x = 4

Substituting x = y - 4 into 3x + 2y = 12 allows you to solve for y, then find x.

Part 3: Analysis, Evaluation, and Creation

Analyze the following system of equations and determine if it has a unique solution, no solution, or infinitely many solutions. Explain your reasoning. 4x - 2y = 6 2x - y = 3

The system has a unique solution as the lines intersect at one point.

Which of the following systems has no solution? (Select all that apply)

undefined. A) x + y = 4 and 2x + 2y = 8
undefined. B) x - y = 1 and 2x - 2y = 3 ✓
undefined. C) 3x + y = 7 and 6x + 2y = 14
undefined. D) x + 2y = 5 and 2x + 4y = 10

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Systems with no solution have parallel lines that do not intersect.

If two equations in a system are multiples of each other, what type of solution does the system have?

undefined. A) Unique solution

undefined. B) No solution

undefined. C) Infinitely many solutions ✓

undefined. D) Cannot be determined

If two equations are multiples of each other, the system has infinitely many solutions.

Evaluate the effectiveness of the substitution method compared to the elimination method for solving systems of equations. Discuss scenarios where one might be preferred over the other.

The substitution method is effective for simpler equations, while elimination is better for larger systems or when coefficients are easily manipulated.

Create a system of equations that has a unique solution. Solve it using the substitution method and explain each step.

1. Equation 1

x + y = 5

2. Equation 2

x - y = 1

3. Unique solution

x = 3, y = 2

An example system could be x + y = 5 and x - y = 1, which can be solved using substitution.

In a real-world scenario, when might it be necessary to solve a system of equations? Choose the most appropriate example.

undefined. A) Calculating the area of a rectangle

undefined. B) Determining the point of intersection for two roads ✓

undefined. C) Measuring the volume of a cylinder

undefined. D) Estimating the time for a trip

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A real-world scenario for solving a system of equations is determining the point of intersection for two roads.