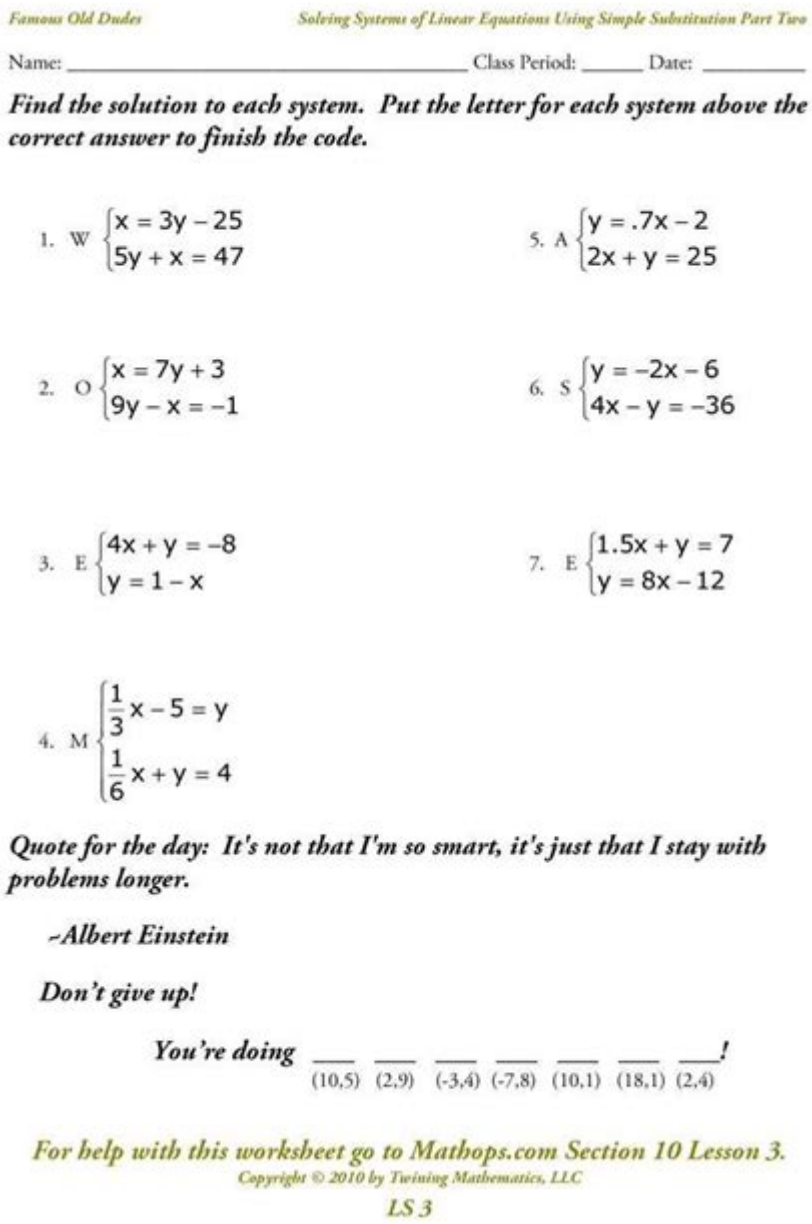
Solving Systems By Substitution Part 2 Answer Key



Famous Old Dudes *Solving Systems of Linear Equations Using Simple Substitution Part Two*

Name: _____ Class Period: _____ Date: _____

Find the solution to each system. Put the letter for each system above the correct answer to finish the code.

1. W $\begin{cases} x = 3y - 25 \\ 5y + x = 47 \end{cases}$

2. O $\begin{cases} x = 7y + 3 \\ 9y - x = -1 \end{cases}$

3. E $\begin{cases} 4x + y = -8 \\ y = 1 - x \end{cases}$

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

5. A $\begin{cases} y = .7x - 2 \\ 2x + y = 25 \end{cases}$

6. S $\begin{cases} y = -2x - 6 \\ 4x - y = -36 \end{cases}$

7. E $\begin{cases} 1.5x + y = 7 \\ y = 8x - 12 \end{cases}$

Quote for the day: It's not that I'm so smart, it's just that I stay with problems longer.

~Albert Einstein

Don't give up!

You're doing ___ ___ ___ ___ ___ ___ ___***!***
(10,5) (2,9) (-3,4) (-7,8) (10,1) (18,1) (2,4)

For help with this worksheet go to Mathops.com Section 10 Lesson 3.

LS 3

Solving systems by substitution part 2 answer key is an essential component of learning algebra and understanding how to find the solutions to systems of equations. In this article, we will explore the substitution method in greater detail, provide examples, and present an answer key to help you verify your solutions.

Understanding the Substitution Method

The substitution method is one of the primary techniques used to solve systems of equations. It involves solving one of the equations for one variable and then substituting that expression into the other equation. This method is particularly useful when one equation is easily solvable for a variable.

Steps for the Substitution Method

To effectively use the substitution method, follow these steps:

1. Solve one equation for one variable.
- Choose either of the equations. If one is already solved for a variable, use it.

2. Substitute the expression into the other equation.
- Replace the variable in the second equation with the expression you found in step 1.

3. Solve the resulting equation.
- This will give you the value of one variable.

4. Substitute back to find the other variable.
- Once you have one variable's value, plug it back into one of the original equations to find the other variable.

5. Write the solution as an ordered pair.
- The solution to the system of equations will be in the form (x, y).

Example Problems

Let's go through a couple of examples to illustrate the substitution method.

Example 1

Consider the following system of equations:

1. $y = 2x + 3$
2. $3x + y = 9$

Step 1: Solve one equation for one variable.

The first equation is already solved for y.

Step 2: Substitute the expression into the other equation.

Substituting y in the second equation:

$$
3x + (2x + 3) = 9
$$

Step 3: Solve the resulting equation.

$$
3x + 2x + 3 = 9
$$
$$
5x + 3 = 9
$$

Subtracting 3 from both sides:
$$
5x = 6
$$
Dividing by 5:
$$
x = \frac{6}{5}
$$

Step 4: Substitute back to find the other variable.

Now plug x back into the first equation to find y:

$$
y = 2\left(\frac{6}{5}\right) + 3
$$
$$
y = \frac{12}{5} + \frac{15}{5} = \frac{27}{5}
$$

Step 5: Write the solution as an ordered pair.

The solution is $\left(\frac{6}{5}, \frac{27}{5}\right)$.

Example 2

Now let’s try another example:

1. $2x + y = 10$
2. $x - 2y = -4$

Step 1: Solve one equation for one variable.

We can solve the first equation for y:

$$
y = 10 - 2x
$$

Step 2: Substitute the expression into the other equation.

Substituting y into the second equation:

$$
x - 2(10 - 2x) = -4
$$

Step 3: Solve the resulting equation.

Expanding:
$$

$$
x - 20 + 4x = -4
$$
Combining like terms:
$$
5x - 20 = -4
$$
Adding 20 to both sides:
$$
5x = 16
$$
Dividing by 5:
$$
x = \frac{16}{5}
$$

Step 4: Substitute back to find the other variable.

Now plug x back into the equation for y:

$$
y = 10 - 2\left(\frac{16}{5}\right)
$$
$$
y = 10 - \frac{32}{5} = \frac{50}{5} - \frac{32}{5} = \frac{18}{5}
$$

Step 5: Write the solution as an ordered pair.

The solution is $\left(\frac{16}{5}, \frac{18}{5}\right)$.

Answer Key for Practice Problems

To reinforce your understanding, here’s a set of practice problems followed by an answer key.

Practice Problems

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

2.
- $5x - y = 10$
- $y = 2x + 3$

3.
- $3x + 2y = 12$
- $x - y = 1$

4.
- $y - 2x = 1$
- $2y + x = 10$

Answer Key

1.
- Solution: $(3, 5)$

2.
- Solution: $(3, 9)$

3.
- Solution: $(2, 3)$

4.
- Solution: $(3, 7)$

Conclusion

The substitution method is a powerful tool for solving systems of equations. By mastering this technique, students can easily tackle a variety of problems in algebra. Practicing with problems and checking your work against an answer key can enhance your understanding and proficiency in using the substitution method. Remember, the key to success in algebra is practice, so keep solving!

Frequently Asked Questions

What is the substitution method in solving systems of equations?

The substitution method involves solving one of the equations for one variable and then substituting that expression into the other equation.

How do you check your solution after using substitution?

To check your solution, substitute the values of the variables back into the original equations to see if both equations are satisfied.

What types of systems can be solved using substitution?

Substitution can be used for all types of systems, including consistent, inconsistent, and dependent systems.

What should you do if you encounter a fraction in the substitution process?

If you encounter a fraction, you can either simplify it or multiply the entire equation by the denominator to eliminate the fraction before proceeding.

Can substitution be used when equations are not in standard

form?

Yes, substitution can be used regardless of the form of the equations, but it may be easier if the equations are rearranged into a more convenient form.

What is a common mistake to avoid when using substitution?

A common mistake is forgetting to substitute correctly or miscalculating the values when substituting into the second equation.

How can you identify if a system has no solution using substitution?

If, after substitution, you end up with a false statement (e.g., 0 = 5), it indicates that the system has no solution.

What is the advantage of using substitution over elimination?

The advantage of substitution is that it can be more straightforward when one equation is already solved for a variable or when the coefficients are complex.

Solving Systems By Substitution Part 2 Answer Key

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