Solve The Quation, X+(2)/(6)=(3)/(6), For Given Variable. Write Your Final Answer As A Reduced Fraction.

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When confronting algebraic equations, the goal is to find the value of the variable that makes the equation true. In this case, the equation provided is:

X + (2/6) = (3/6)

Our task is to solve for X and express the final answer as a reduced fraction. This involves understanding basic algebraic principles, simplifying fractions, and performing operations to isolate the variable.

In this comprehensive guide, we will walk through the step-by-step process of solving the equation, explaining each move clearly. We will also explore related concepts such as simplifying fractions, balancing equations, and verifying solutions, ensuring a thorough understanding of the problem.

Understanding the Given Equation

Before diving into solving, it’s essential to understand the structure of the equation:

X + (2/6) = (3/6)

- The variable to solve for is X.
- The fractions involved are (2/6) and (3/6).

The main challenge is to isolate X on one side of the equation.

Step 1: Simplify the Fractions

Simplifying fractions makes calculations cleaner and easier to interpret.

1.1 Simplify (2/6)

- The numerator and denominator are both divisible by 2.
- (2/6) simplifies to (1/3).

1.2 Simplify (3/6)

- The numerator and denominator are both divisible by 3.
- (3/6) simplifies to (1/2).

Now, rewriting the original equation with simplified fractions:

X + (1/3) = (1/2)

Step 2: Isolate X

To find the value of X, we need to isolate it on one side of the equation.

2.1 Subtract (1/3) from both sides

- This maintains the equality while moving the fraction to the right side:

X + (1/3) - (1/3) = (1/2) - (1/3)

- Simplifies to:

X = (1/2) - (1/3)

Step 3: Subtract Fractions

Subtracting (1/3) from (1/2) requires common denominators.

3.1 Find the Least Common Denominator (LCD)

- The denominators are 2 and 3.
- The LCD of 2 and 3 is 6.

3.2 Convert both fractions to have denominator 6

- (1/2) = (3/6)
- (1/3) = (2/6)

3.3 Perform the subtraction

- (3/6) - (2/6) = (3 - 2)/6 = (1/6)

Thus,

X = (1/6)

Step 4: Final Answer as a Reduced Fraction

The calculated value for X is (1/6). Since (1/6) is already in its simplest form, it is the final answer.

4.1 Final Answer

- X = **1/6**

Additional Insights and Tips

Understanding how to solve equations involving fractions is fundamental in algebra. Here are some useful tips:

1. **Simplify fractions early:** Always reduce fractions to their lowest terms to make calculations easier.
2. **Find common denominators:** When adding or subtracting fractions, convert them to equivalent fractions with the same denominator.
3. **Perform inverse operations:** Use addition/subtraction to move terms across the equation, and multiplication/division to isolate the variable.
4. **Check your work:** Substitute your solution back into the original equation to verify correctness.

Verification of the Solution

To ensure the solution X = (1/6) is correct, substitute it back into the original equation:

X + (2/6) = (3/6)

Replace X with (1/6):

(1/6) + (2/6) = (3/6)

Add the fractions:

(1/6) + (2/6) = (3/6)

Since the sum on the left is (3/6), which equals the right side, the solution is verified as correct.

Understanding the Importance of Reduced Fractions

Expressing the answer as a reduced fraction is crucial because:

- It simplifies the expression, making it easier to interpret.
- It ensures the solution is in its simplest form, which is standard in algebra.
- It prevents confusion in subsequent calculations or when comparing solutions.

In this case, (1/6) is already in lowest terms, so it is the appropriate final answer.

Practical Applications of Solving Such Equations

While the problem appears straightforward, the skills involved are widely applicable:

- In Science: Calculating precise ratios or concentrations.
- In Finance: Computing interest rates or proportions.
- In Daily Life: Adjusting recipes, sharing resources, or measuring ingredients proportionally.
- In Engineering and Technology: Designing systems that depend on proportional relationships.

Understanding how to manipulate fractions and solve equations is a foundational skill that supports many fields.

Conclusion

In summary, solving the equation X + (2/6) = (3/6) involves simplifying fractions, isolating the variable, performing subtraction with common denominators, and expressing the solution in its simplest form. The process highlights essential algebraic techniques, including fraction simplification, common denominator finding, and verification of solutions. The final answer, X = **1/6**, demonstrates the importance of expressing solutions as reduced fractions for clarity and precision.

By mastering these steps, students and professionals alike can confidently approach similar problems involving fractions and algebraic equations, building a solid foundation for more complex mathematical challenges.

Frequently Asked Questions

What is the equation to solve for x in the expression X + (2/6) = (3/6)?

The equation is X + (2/6) = (3/6).

How do I isolate X in the equation X + (2/6) = (3/6)?

Subtract (2/6) from both sides: X = (3/6) - (2/6).

What is the simplified form of (3/6) minus (2/6)?

Subtracting the fractions gives (3/6) - (2/6) = (1/6).

What is the final value of X after solving the equation?

X = (1/6).

Should the answer be expressed as a reduced fraction?

Yes, the answer is already in reduced form: (1/6).

Is the solution to the equation unique?

Yes, the solution for X is uniquely (1/6).

Can this method be applied to similar equations with different fractions?

Yes, subtract the fractions on the right from the left after isolating X to find the solution.

What are common mistakes to avoid when solving such equations?

Avoid forgetting to reduce fractions and ensure correct subtraction of fractions with common denominators.

How do I verify the solution X = (1/6)?

Plug X = (1/6) back into the original equation to check if both sides are equal.

What is the importance of reducing fractions in the final answer?

Reducing fractions simplifies the answer and presents it in the simplest, most understandable form.

Additional Resources

Solve The Equation, X + (2/6) = (3/6), For Given Variable. Write Your Final Answer As A Reduced Fraction.

Introduction

Mathematics, often considered the language of science, hinges on the ability to manipulate and solve equations. Among the foundational skills in algebra, solving for an unknown variable in a simple linear equation is crucial. This process not only aids in understanding more complex mathematical concepts but also enhances logical reasoning and problem-solving skills.

In this detailed exploration, we analyze the problem: "Solve the equation, X + (2/6) = (3/6), for the given variable. Write your final answer as a reduced fraction." Although seemingly straightforward, this problem offers an excellent opportunity to revisit core algebraic principles, understand the importance of fractions, and practice reduction techniques.

This article aims to dissect the problem methodically, explaining each step thoroughly, and discussing related concepts vital for mastering such equations.

Understanding the Problem

Before diving into the solution, let's clarify the components involved:

- Equation: X + (2/6) = (3/6)
- Goal: Solve for X
- Final Answer: Expressed as a reduced fraction

At first glance, the equation contains fractions, which often pose a challenge for learners unfamiliar with fraction operations. However, the key lies in understanding how to isolate the variable and perform operations involving fractions.

Breaking Down the Equation

The equation:

$$ X + \frac{2}{6} = \frac{3}{6} $$

can be approached systematically:

- Recognize that the equation involves addition of a variable and a fraction.
- The fractions involved are $\frac{2}{6}$ and $\frac{3}{6}$.

The core operation to isolate X is subtraction, which involves moving $\frac{2}{6}$ to the right side of the equation:

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

Now, the task reduces to subtracting two fractions with the same denominator.

Simplifying Fractions

Before performing the subtraction, it is advisable to reduce the fractions to their simplest forms:

- $\frac{2}{6}$: Both numerator and denominator are divisible by 2:

$$ \frac{2 \div 2}{6 \div 2} = \frac{1}{3} $$

- $\frac{3}{6}$: Both numerator and denominator are divisible by 3:

$$ \frac{3 \div 3}{6 \div 3} = \frac{1}{2} $$

Thus, the equation simplifies to:

$$ X = \frac{1}{2} - \frac{1}{3} $$

Performing the Subtraction of Fractions

When subtracting fractions, especially with different denominators, the process involves finding a common denominator.

Step 1: Find the Least Common Denominator (LCD)

- The denominators are 2 and 3.
- The LCD of 2 and 3 is 6.

Step 2: Convert both fractions to equivalent fractions with denominator 6:

$$
\frac{1}{2} = \frac{1 \times 3}{2 \times 3} = \frac{3}{6}
$$
$$
\frac{1}{3} = \frac{1 \times 2}{3 \times 2} = \frac{2}{6}
$$

Step 3: Perform the subtraction:

$$
X = \frac{3}{6} - \frac{2}{6} = \frac{3 - 2}{6} = \frac{1}{6}
$$

Final Result and Fraction Reduction

The solution to the equation is:

$$
X = \frac{1}{6}
$$

Since $\frac{1}{6}$ is already in its simplest form, there is no further reduction necessary.

Additional Perspectives and Common Pitfalls

While the problem is straightforward, several common mistakes can occur when solving similar equations:

1. Neglecting to reduce fractions:
- Failing to simplify fractions before operations can complicate calculations.

2. Incorrect common denominator calculation:
- Using an incorrect LCD can lead to wrong results.

3. Misapplication of operations:

- Forgetting to perform the same operation to both sides of the equation ensures the equality remains valid.

4. Overlooking the importance of reduction:
- Not reducing the final fraction may result in non-simplified answers, which might not meet the problem's requirements.

Broader Implications and Educational Significance

This problem exemplifies fundamental algebraic principles:

- Isolating the variable: The primary goal is to manipulate the equation to have X alone on one side.
- Handling fractions: Understanding how to operate with fractions is essential, especially in more advanced math.
- Simplification: Reducing fractions is a critical skill that ensures clarity, precision, and adherence to mathematical standards.

In educational settings, such problems reinforce the importance of systematic problem-solving strategies, including:

- Recognizing equivalent fractions
- Finding common denominators
- Applying inverse operations
- Simplifying results

Practical Applications

Solving equations involving fractions isn't just an academic exercise; it has real-world application in:

- Financial calculations: Adjusting proportions, rates, or ratios.
- Engineering: Precise measurements and calculations involving ratios.
- Computer science: Algorithms involving fractional data or probabilities.
- Science: Concentrations in chemistry, ratios in physics, or statistical data analysis.

Mastering the skill to solve such equations as demonstrated here underpins competence in these fields.

Conclusion

The problem, "Solve the equation, X + (2/6) = (3/6)", serves as an illustrative example of the fundamental process of solving linear equations with fractions. Through careful reduction and operation, the solution is straightforward:

\[
\boxed{
X = \frac{1}{6}
}
\]

This answer is already in its simplest form, demonstrating the importance of fraction reduction. The systematic approach—reducing fractions, finding common denominators, performing subtraction, and verifying the result—highlights essential algebraic skills.

As learners progress into more complex problems, these principles remain foundational, enabling confident navigation through advanced mathematical challenges. Whether in academics, professional practice, or everyday problem-solving, the ability to manipulate and solve fractional equations like this one is a vital mathematical competency.

References

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