

Solve For X $5x+5=3x+4$ Give Your Answer As A Fraction

Solve For X $5x+5=3x+4$ Give Your Answer As A Fraction

When tackling algebraic equations, understanding how to isolate the variable and express your answer as a fraction is a fundamental skill. The equation $5x + 5 = 3x + 4$ presents a straightforward example of solving for an unknown variable, x . In this comprehensive guide, we will walk through the steps to solve this equation, interpret the solution, and present the answer as a simplified fraction. Whether you're a student preparing for exams or someone brushing up on basic algebra, mastering this process is essential for advancing your math skills.

Understanding the Equation $5x + 5 = 3x + 4$

Before diving into solving, it's important to understand the structure of the equation:

- Linear Equation: The equation involves x to the first power, making it linear.
- Balance Principle: Whatever operation you perform on one side of the equation must be done on the other to maintain equality.
- Goal: Isolate x to one side to find its value.

Step-by-Step Solution of $5x + 5 = 3x + 4$

Let's carefully work through solving this equation.

Step 1: Subtract $3x$ from both sides

This helps to gather all x terms on one side.

$$\begin{aligned} &\backslash[\\ &5x + 5 - 3x = 3x + 4 - 3x \\ &\backslash] \end{aligned}$$

Simplifying both sides:

$$\begin{aligned} & \backslash[\\ & (5x - 3x) + 5 = 4 \\ & \backslash] \\ & \backslash[\\ & 2x + 5 = 4 \\ & \backslash] \end{aligned}$$

Step 2: Subtract 5 from both sides

This isolates the term containing x.

$$\begin{aligned} & \backslash[\\ & 2x + 5 - 5 = 4 - 5 \\ & \backslash] \end{aligned}$$

Simplify:

$$\begin{aligned} & \backslash[\\ & 2x = -1 \\ & \backslash] \end{aligned}$$

Step 3: Divide both sides by 2

To solve for x, divide both sides by 2:

$$\begin{aligned} & \backslash[\\ & \frac{2x}{2} = \frac{-1}{2} \\ & \backslash] \end{aligned}$$

Simplify:

$$\begin{aligned} & \backslash[\\ & x = -\frac{1}{2} \\ & \backslash] \end{aligned}$$

Expressing the Solution as a Fraction

The solution $x = -1/2$ is already expressed as a fraction, which is the most simplified form of our answer. The negative sign indicates that x is less than zero, and the numerator and denominator are coprime (share no common factors other than 1).

Key Points to Remember When Solving Linear Equations

Understanding the process and common pitfalls can help you improve your algebra skills:

1. **Always perform the same operation on both sides** to keep the equation balanced.
2. **Combine like terms** when possible to simplify the equation.
3. **Isolate the variable** step-by-step, typically starting with addition/subtraction, then multiplication/division.
4. **Express your answer as a simplified fraction** when fractions are involved to ensure clarity and precision.

Why Express Answers as Fractions?

Expressing solutions as fractions offers several advantages:

- **Precision:** Fractions retain exact values, unlike decimals which may be rounded.
- **Ease of further calculations:** Fractions are often easier to manipulate in subsequent algebraic steps.
- **Clarity:** Fractions clearly show the ratio between numerator and denominator, aiding understanding.

In our example, $x = -1/2$ precisely indicates that x is negative one-half.

Additional Tips for Solving Similar Equations

If you're working with more complex equations, consider these tips:

1. Always check for like terms

- Combine like terms on each side before moving variables around.

2. Be cautious with negative signs

- Sign errors are common; double-check each step.

3. Simplify fractions whenever possible

- Reduce fractions to their simplest form to make solutions clearer.

4. Verify your solution

- Substitute your answer back into the original equation to confirm correctness.

Example: Solving Another Linear Equation

Let's apply the same process to a different equation:

Equation: $7x - 3 = 2x + 9$

Solution:

1. Subtract $2x$ from both sides:

$$\begin{aligned} & \backslash[\\ & 7x - 2x - 3 = 9 \\ & \backslash] \end{aligned}$$

$$\begin{aligned} & \backslash[\\ & 5x - 3 = 9 \\ & \backslash] \end{aligned}$$

2. Add 3 to both sides:

$$\begin{aligned} & \backslash[\\ & 5x = 12 \\ & \backslash] \end{aligned}$$

3. Divide both sides by 5:

```
\[  
x = \frac{12}{5}  
\]
```

Expressed as a fraction, $x = 12/5$.

Conclusion: Mastering the Art of Solving Linear Equations

Solving equations like $5x + 5 = 3x + 4$ is foundational in algebra. The key is to follow systematic steps: isolate the variable, perform inverse operations, and express the solution as a simplified fraction. Remember, the process involves balancing the equation at each step and carefully handling negative signs and fractions. Mastery of these techniques not only helps in solving simple equations but also builds a strong foundation for tackling more advanced algebraic concepts.

By practicing these steps and understanding the underlying principles, you'll become more confident in solving linear equations and expressing your answers precisely as fractions. Whether for academic purposes, standardized tests, or real-world applications, these skills are invaluable in your mathematical toolkit.

Keywords: solve for x, algebra, linear equations, solve $5x + 5 = 3x + 4$, express as a fraction, algebraic solution, solving equations step-by-step, fraction solution, math tips, algebra practice

Frequently Asked Questions

What is the first step to solve the equation $5x + 5 = 3x + 4$?

Subtract $3x$ from both sides to get $2x + 5 = 4$.

How do you isolate the variable x in the equation $5x + 5 = 3x + 4$?

Subtract $3x$ from both sides and then subtract 5 from both sides to isolate x .

What is the simplified form after subtracting $3x$ from both sides in $5x + 5 = 3x + 4$?

$2x + 5 = 4$.

How do you solve $2x + 5 = 4$ for x ?

Subtract 5 from both sides to get $2x = -1$, then divide both sides by 2 to find $x = -1/2$.

What is the value of x in the equation $5x + 5 = 3x + 4$ expressed as a fraction?

$x = -1/2$.

Can you explain the steps to solve for x in $5x + 5 = 3x + 4$?

Yes. First, subtract $3x$ from both sides: $2x + 5 = 4$. Then, subtract 5: $2x = -1$. Finally, divide both sides by 2: $x = -1/2$.

What is the importance of expressing the answer as a fraction in algebra?

Expressing answers as fractions provides an exact value rather than a decimal approximation, which is important for precision.

Is the solution to $5x + 5 = 3x + 4$ unique?

Yes, the solution is unique and $x = -1/2$.

How would the answer change if the equation was $5x + 5 = 3x + 6$?

Subtract $3x$ from both sides: $2x + 5 = 6$. Then, subtract 5: $2x = 1$. Divide both sides by 2: $x = 1/2$.

What is the general method to solve linear equations like $5x + 5 = 3x + 4$?

The general method involves isolating the variable by combining like terms, then solving for x through inverse operations like addition/subtraction and division.

Additional Resources

Solve For X: $5x + 5 = 3x + 4$ – Give Your Answer As A Fraction

When it comes to algebra, solving for an unknown variable, particularly 'x,' is one of the most fundamental yet essential skills. The equation $5x + 5 = 3x + 4$ offers a straightforward example of linear equations and serves as a perfect illustration for understanding how to isolate variables and express solutions precisely in fractional form. This comprehensive review will delve into the step-by-step process of solving the equation, explore underlying algebraic principles, discuss common pitfalls, and highlight the importance of expressing answers as fractions.

Understanding the Equation: $5x + 5 = 3x + 4$

Before delving into the solution process, it's crucial to understand what the equation represents and the goal of solving it.

Equation Breakdown:

- The left side: $5x + 5$
- The right side: $3x + 4$

This is a linear equation where 'x' is the variable, and the goal is to find the value of 'x' that makes both sides equal.

Objective:

- Isolate 'x' on one side of the equation.
- Express the value of 'x' as a fraction in simplest form.

Step-by-Step Solution Process

Solving the equation involves systematic steps:

Step 1: Write Down the Equation

$5x + 5 = 3x + 4$

Step 2: Simplify Both Sides (if necessary)

In this case, both sides are already simplified.

Step 3: Move Variable Terms to One Side

To isolate 'x,' we need to gather all 'x' terms on one side. Usually, it's easiest to subtract the smaller 'x' term from both sides.

- Subtract $3x$ from both sides:

$$\backslash[5x - 3x + 5 = 3x - 3x + 4 \backslash]$$

$$\backslash[2x + 5 = 4 \backslash]$$

Step 4: Move Constant Terms to the Other Side

- Subtract 5 from both sides:

$$\backslash[2x + 5 - 5 = 4 - 5 \backslash]$$

$$\backslash[2x = -1 \backslash]$$

Step 5: Solve for 'x' by Dividing

- Divide both sides by the coefficient of 'x', which is 2:

$$\backslash[x = \frac{-1}{2} \backslash]$$

Final Answer:

$$\backslash[\boxed{\frac{-1}{2}} \backslash]$$

This fractional form is the exact solution, and expressing the answer as a fraction provides precision, especially in cases where the decimal representation may be repeating or non-terminating.

Why Express Solutions as Fractions?

Expressing solutions in fractional form is not merely a stylistic choice; it's an important aspect of mathematical precision and clarity.

Key Reasons:

- Exactness: Fractions represent the precise value, unlike decimals which may be rounded.
- Ease of Simplification: Fractions can often be simplified to their lowest terms, making the solution more elegant.
- Understanding Ratios: Fractions inherently depict ratios, aiding in conceptual understanding.
- Preparation for Advanced Math: Many higher-level math concepts, such as algebraic fractions and rational expressions, rely on fractional solutions.

Deeper Dive into Algebraic Principles

Understanding the broader algebraic principles involved in solving the equation enhances comprehension and prepares you for more complex problems.

Linear Equations and Their Properties

- Linear equations involve variables raised to the first power.
- The general form: $ax + b = cx + d$, where 'a,' 'b,' 'c,' and 'd' are constants.
- The solution involves finding the value of 'x' that satisfies the equality.

Principles Used in the Solution

- Equivalence: Whatever operation you perform on one side, you must perform on the other.
- Inverse Operations: Addition and subtraction are inverse; multiplication and division are inverses.
- Maintaining Balance: The core idea is to keep the equation balanced at each step.

Common Mistakes and How to Avoid Them

While the process appears straightforward, several common pitfalls can trip up students:

1. Incorrect Subtraction/Additions:
 - Example: Subtracting $5x$ from the constant term instead of both sides.
2. Forgetting to Perform the Same Operation on Both Sides:
 - This is fundamental but easy to overlook.
3. Dividing by Zero:
 - Not applicable in this specific problem, but always check the coefficient of 'x' before dividing.
4. Simplifying Fractions Improperly:
 - Always reduce fractions to their lowest terms, e.g., $\frac{-1}{2}$ is already simplified.

Tips to Avoid Mistakes:

- Write each step clearly.
- Double-check each operation.
- Use the properties of equality diligently.
- Practice similar problems to build confidence.

Expressing the Final Answer as a Fraction: Significance and Clarity

The question specifically asks to “Give Your Answer As A Fraction,” which highlights the importance of precise communication in mathematics.

Advantages of expressing the answer as $\frac{-1}{2}$:

- It's exact and unambiguous.
- It simplifies further calculations, especially if you need to substitute 'x' into other equations.
- It demonstrates a clear understanding of fraction reduction and algebraic manipulation.

Additional Tips:

- Always check if the fraction can be simplified.
- When dealing with negative fractions, place the negative sign in the numerator or outside the fraction for clarity.
- Practice converting decimals to fractions when necessary.

Applications and Real-World Contexts

While solving for 'x' in this simple equation might seem purely academic, the skills learned extend far beyond the classroom.

Practical applications include:

- Financial calculations: Determining ratios or proportions.
- Engineering: Solving for unknown variables in design equations.
- Science: Calculating reaction rates or concentrations.
- Statistics: Working with ratios and probabilities.

Mastering the process of solving equations and expressing solutions as fractions is foundational for success in these fields.

Summary and Final Thoughts

The process of solving the equation $5x + 5 = 3x + 4$ is a quintessential algebraic problem that encapsulates core principles of solving linear equations. The steps involve:

- Moving all variable terms to one side.
- Moving constants to the opposite side.

- Simplifying the equation.
- Dividing to isolate 'x.'

The final answer, $\boxed{\frac{-1}{2}}$, exemplifies the importance of expressing solutions precisely as fractions, which promote clarity, accuracy, and readiness for more advanced mathematics.

Key takeaways:

- Always perform the same operation on both sides of the equation.
- Simplify fractions to their lowest terms.
- Keep track of signs (positive/negative).
- Understand the significance of fractional solutions in mathematical and real-world contexts.

By mastering these techniques, students and practitioners not only solve equations accurately but also develop a deeper understanding of algebraic reasoning, critical thinking, and problem-solving skills necessary across disciplines.

In conclusion, solving equations like $5x + 5 = 3x + 4$ and expressing the answer as a fraction is an essential skill that underpins much of higher mathematics and scientific computation. Practice, attention to detail, and conceptual understanding are the keys to mastering this fundamental aspect of algebra.

Solve For X 5x 5 3x 4give Your Answer As A Fraction

Solve For X 5x 5 3x 4give Your Answer As A Fraction

Related Articles

- [-x-2+15x Simplify Combining Like Terms](#)
- [HELP PLS 100 POINTS! Please Someone Help Me!](#)
- [Please Help Due In 30 Minutes Will Give Brainliest.](#)

[Back to Home](#)