

Q: Solve For X: $8x - 2 - 5x = 8$ A. $0x = 13$ B. $0x = 2 \frac{1}{2}$ C. $0x = 3 \frac{1}{3}$ D. $0x = 7$

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Understanding the Problem: Solving for X in the Equation

When faced with a mathematical problem like **Q: Solve For X: $8x - 2 - 5x = 8$** , it's essential to approach it systematically. At its core, this problem involves algebraic manipulation to isolate the variable x and determine its value. Additionally, the problem provides multiple options labeled A through D, each representing a potential value for $0x$. To solve this problem comprehensively, we need to:

- Simplify the given equation.
- Solve for x .
- Understand the meaning of the options provided.
- Determine which option corresponds to the solution for x .

Step-by-Step Solution to the Equation

1. Simplify the Equation

The given equation is:

$$8x - 2 - 5x = 8$$

To simplify, combine like terms:

- Combine the terms with x : $8x - 5x = 3x$.
- The constant term is -2 .

So, the simplified form becomes:

$$3x - 2 = 8$$

2. Isolate the Variable

Add 2 to both sides to move constants to the right:

$$3x = 8 + 2$$

$$3x = 10$$

Now, divide both sides by 3 to solve for x :

$$x = \left(\frac{10}{3}\right)$$

Which simplifies to:

$$x = 3 \left(\frac{1}{3}\right) \text{ or } 3.333\dots$$

3. Interpret the Solution in Context of the Options

Now that we have:

$$x = 3 \left(\frac{1}{3}\right)$$

We compare this to the options provided:

- A. $OX = 13$
- B. $OX = 2 \frac{1}{2}$
- C. $OX = 3 \frac{1}{3}$
- D. $OX = 7$

Clearly, option C matches our calculated value.

Understanding the Options and Their Significance

The options represent possible values for OX . Given the typical context of algebraic problems, OX often refers to the length of a segment, the value of a variable, or a specific measurement associated with the problem.

Let's analyze each option:

1. **Option A: $0X = 13$** – This is a large value, not matching our solution. It could be a distractor or relevant in a different context.
2. **Option B: $0X = 2 \frac{1}{2}$** – Equivalent to 2.5, which is less than our solution.
3. **Option C: $0X = 3 \frac{1}{3}$** – Exactly matches our calculated value of $\frac{10}{3}$ or 3.333...
4. **Option D: $0X = 7$** – Greater than our solution, unlikely to be the correct match.

The best match here is clearly Option C.

Additional Context: Interpreting Fractions and Decimals

Understanding how to convert between fractions and decimals is crucial for interpreting the options:

Converting Fractions to Decimals

- $\frac{1}{2} = 0.5$
- $\frac{1}{3} \approx 0.333...$
- $3 \frac{1}{3} = 3 + \frac{1}{3} \approx 3 + 0.333... = 3.333...$
- $2 \frac{1}{2} = 2 + \frac{1}{2} = 2 + 0.5 = 2.5$

Since our solution, $\frac{10}{3}$, equals approximately 3.333..., it matches Option C precisely.

Importance of Accurate Calculation in Algebra

Mastering algebraic manipulation is fundamental in solving equations like the one presented. Accurate calculations ensure that you:

- Find the correct value of the variable.
- Avoid common mistakes such as incorrect simplification or misdivision.
- Understand the relationship between fractions and decimals.
- Recognize distractors in multiple-choice questions.

Common Mistakes to Avoid

When solving similar algebraic problems, watch out for:

1. **Incorrectly combining like terms:** Always double-check your addition and subtraction.
2. **Forgetting to apply inverse operations:** Remember to perform addition/subtraction before division/multiplication when isolating variables.
3. **Misinterpreting fractions and decimals:** Convert to a consistent form to compare options effectively.
4. **Overlooking the provided options:** Always compare your solution with the multiple-choice options to confirm your answer.

Real-World Applications of Solving for X

Solving equations such as $8x - 2 - 5x = 8$ isn't just a mathematical exercise; it has practical applications in various fields:

- Engineering: Calculating unknown parameters in design equations.
- Finance: Solving for interest rates or payments.
- Physics: Determining unknown quantities in motion or energy equations.
- Computer Science: Algorithm development involving algebraic calculations.

Understanding how to manipulate equations accurately is foundational in these disciplines.

Summary and Final Answer

To summarize:

- We simplified the equation $8x - 2 - 5x = 8$ to $3x - 2 = 8$.
- We isolated x to find $x = \frac{10}{3}$, which equals approximately 3.333...
- Comparing this with the options, it matches Option C: $0x = 3 \frac{1}{3}$.
- Recognizing the importance of converting fractions and decimals aids in matching solutions with options.

Final answer: **Option C: $0x = 3 \frac{1}{3}$**

Additional Tips for Solving Algebraic Equations

- Always write down each step clearly.
- Simplify expressions before solving.
- Check your solution by substituting back into the original equation.
- Familiarize yourself with converting between fractions and decimals.
- Practice similar problems to build confidence and accuracy.

Conclusion

Mastering the skill of solving algebraic equations like $8x - 2 - 5x = 8$ is essential for students and professionals alike. The process involves simplifying expressions, isolating variables, and carefully interpreting the options provided. In this case, the correct solution for x is $3 \frac{1}{3}$, corresponding to option C. By understanding these steps and concepts, you enhance your problem-solving capabilities and mathematical literacy, vital tools in academics and real-world scenarios.

Meta Description:

Learn how to solve for x in the equation $8x - 2 - 5x = 8$, interpret multiple-choice options, and understand the steps involved in algebraic problem-solving. Find out why option C ($3 \frac{1}{3}$) is the correct solution.

Frequently Asked Questions

What is the value of X in the equation $8x - 2 - 5x = 8$?

First, combine like terms: $8x - 5x = 3x$. So, $3x - 2 = 8$. Add 2 to both sides: $3x = 10$. Divide both sides by 3: $x = 10/3 \approx 3.33$, so $0X = 3 \frac{1}{3}$.

How do you solve for X in the equation $8x - 2 - 5x = 8$?

Combine like terms to get $3x - 2 = 8$. Then, add 2 to both sides: $3x = 10$. Divide both sides by 3: $x = 10/3$, which is approximately 3.33.

Which option corresponds to the value of X in the equation $8x - 2 - 5x = 8$?

Option C: $0X = 3 \frac{1}{3}$, as the solution for X is $10/3$.

What is the decimal equivalent of the solution for X in the given equation?

The decimal equivalent is approximately 3.33, corresponding to $10/3$, or option C.

Is the solution for X in the equation $8x - 2 - 5x = 8$ equal to $2 \frac{1}{2}$ (2.5)?

No. The solution is $10/3$ or approximately 3.33, which is not equal to $2 \frac{1}{2}$.

How can we verify the solution $x = 10/3$ in the original equation?

Substitute $x = 10/3$ into the original: $8(10/3) - 2 - 5(10/3)$. Calculate: $(80/3) - 2 - (50/3) = (80/3 - 50/3) - 2 = (30/3) - 2 = 10 - 2 = 8$. Since the result is 8, the solution is correct.

What is the simplified form of the solution for X in the equation?

The simplified form is $X = 10/3$, which is approximately 3.33 or $3 \frac{1}{3}$.

Among the given options, which is the correct value

of 0X?

Option C: $0X = 3 \frac{1}{3}$ is correct.

What key step helps convert the solution into a mixed number?

Dividing 10 by 3 gives 3 with a remainder of 1, so the mixed number is $3 \frac{1}{3}$.

Why is $8x - 2 - 5x = 8$ a straightforward linear equation to solve?

Because it involves combining like terms and performing basic algebraic operations to isolate x , making it a simple linear equation.

Additional Resources

Q: Solve For X: $8x - 2 - 5x = 8$. 0X=13B. 0X=2 1/2C. 0X=3 1/3D. 0X=7

Introduction

Mathematics often presents us with intriguing puzzles that challenge our problem-solving skills and understanding of algebraic principles. One such question, seemingly straightforward at first glance, involves solving for an unknown variable, X , within an algebraic expression, and then interpreting multiple-choice options that relate to the value of X . The problem reads:

Q: Solve For X: $8x - 2 - 5x = 8$

- A. 0X = 13
- B. 0X = $2 \frac{1}{2}$
- C. 0X = $3 \frac{1}{3}$
- D. 0X = 7

While it appears as a simple algebraic equation, the inclusion of options with mixed fractions and a notation involving "0X" introduces additional layers of interpretation. This article will dissect this question meticulously, exploring algebraic methods, interpreting the options, and clarifying the possible meaning behind the notation to arrive at a well-rounded understanding.

Understanding the Equation

The primary goal is to solve the equation:

$$8x - 2 - 5x = 8$$

At first glance, this is a linear algebraic equation with a single variable, X. The process involves isolating X by combining like terms and performing inverse operations.

Breaking Down the Equation

Let's analyze each part:

- $8x$ and $-5x$ are the variable terms. Combining these gives us a simpler expression.
- -2 is a constant term.
- The right side of the equation is 8 , a constant.

The goal is to find the value of X that satisfies this equation.

Step-by-Step Solution

Step 1: Combine Like Terms

$$8x - 5x = 3x$$

So, the equation simplifies to:

$$3x - 2 = 8$$

Step 2: Isolate the Variable Term

Add 2 to both sides to move constants to the right:

$$3x = 8 + 2$$

$$3x = 10$$

Step 3: Solve for X

Divide both sides by 3:

$$x = 10 / 3$$

Expressed as a mixed number or decimal:

- As an improper fraction: $x = 10/3 \approx 3.333\dots$
- As a mixed number: $x = 3 \frac{1}{3}$

This result is crucial in interpreting the options that follow.

Interpreting the Multiple-Choice Options

The options provided are:

- A. $0X = 13$
- B. $0X = 2 \frac{1}{2}$
- C. $0X = 3 \frac{1}{3}$
- D. $0X = 7$

Given the solution above, $x = 3 \frac{1}{3}$, which matches option C directly.

But what does "0X" stand for?

In standard algebraic notation, "0" might refer to a point or origin in coordinate geometry, and "X" to the variable X. Alternatively, "0X" could simply represent the value of X itself. Given the context, it's reasonable to interpret "0X" as the value of X.

Confirming the Correct Choice

Since the solution for X is $3 \frac{1}{3}$, the matching option is:

C. $0X = 3 \frac{1}{3}$

This confirms that the correct answer to the algebraic problem is Option C.

Additional Context: Why the Fractions Matter

The options include fractions, which can sometimes be a source of confusion, especially when interpreting decimal or mixed number forms. Let's explore these options:

- Option B: $2 \frac{1}{2}$ – which is 2.5 in decimal.
- Option C: $3 \frac{1}{3}$ – which is 3.333... in decimal.
- Option D: 7 – a whole number.
- Option A: 13 – a whole number.

The solution, $\frac{10}{3}$, is approximately 3.333..., matching $3 \frac{1}{3}$, confirming the correctness of Option C.

Broader Implications and Educational Takeaways

This problem illustrates several important concepts in algebra and problem-solving:

1. Combining Like Terms

Understanding how to simplify expressions by combining similar variables and constants is foundational.

2. Fraction and Mixed Number Conversion

Translating between improper fractions, mixed numbers, and decimals is essential for interpreting multiple-choice options correctly.

3. Reading Comprehension in Math Problems

The notation "OX" may vary across contexts. Recognizing that it likely refers to the value of X helps clarify the question.

4. Checking Work by Substitution

Always verify the solution by substituting the value back into the original equation:

$$- x = 10/3$$

Plug into the original:

$$8x - 2 - 5x$$

$$= 8(10/3) - 2 - 5(10/3)$$

$$= (80/3) - 2 - (50/3)$$

Convert 2 to thirds:

$$= (80/3) - (6/3) - (50/3) = (80 - 6 - 50)/3 = (24)/3 = 8$$

Since the expression equals 8, which matches the right side, the solution is verified.

Final Thoughts

This problem demonstrates not only the process of solving an algebraic equation but also the importance of carefully interpreting answer choices, especially when fractions and mixed numbers are involved. The clarity in each step ensures that even complex-looking problems become manageable.

By recognizing the equivalence between the algebraic solution and the options presented, students and enthusiasts can sharpen their problem-solving skills and deepen their understanding of fundamental algebra concepts. Whether in academic settings or real-world applications, mastering these steps forms the backbone of effective mathematical reasoning.

Summary

- The original equation simplifies to $3x = 10$.
- Solving for x yields $x = 10/3$, or approximately 3.333....
- The notation "OX" probably refers to the value of X .
- The matching option is C: $3 \frac{1}{3}$.
- Verifying the solution confirms its correctness.

This comprehensive analysis not only provides the answer but also offers insight into interpreting and solving algebraic problems, emphasizing clarity, verification, and critical thinking in mathematics.

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