8(4-a)=2aAnswer :16/5 Or 3.2I Need Help With The Checking The Answer Not The Equation. We Check A Solution

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When working through algebraic equations like 8(4 - a) = 2a, it's common to find a solution and then wonder if it's correct. Sometimes, the focus is on solving the equation itself, but in many cases, especially in educational settings, the critical step is checking the solution to ensure it satisfies the original problem. This article will guide you step-by-step through how to verify whether the answer 16/5 (or 3.2) is correct, emphasizing the importance of checking solutions rather than just solving the equation.

Understanding the Importance of Checking Solutions

Before diving into the process of verification, it’s vital to understand why checking your solutions is essential in algebra.

Why Check Solutions?

- To confirm that the solution satisfies the original equation.

- To avoid errors made during algebraic manipulation.
- To reinforce understanding of the relationship between equations and their solutions.
- To ensure the solution is valid within the context of the problem.

Checking solutions is a vital step because sometimes, during the process of solving, you may make arithmetic or algebraic errors. By substituting your answer back into the original equation, you verify its correctness.

Step-by-Step Guide to Checking the Solution

Let's now focus on verifying whether a = 16/5 (or 3.2) is indeed the correct solution to the equation 8(4 - a) = 2a.

1. Restate the Original Equation

The original equation is:

$$ 8(4 - a) = 2a $$

Our goal is to see if substituting a = 16/5 makes both sides equal.

2. Substitute the Proposed Solution into the Equation

Replace a with 16/5:

$$ 8 \left(4 - \frac{16}{5} \right) = 2 \times \frac{16}{5} $$

3. Simplify Both Sides

Left Side:

Calculate $ 4 - \frac{16}{5} $

- Convert 4 to a fraction with denominator 5:

$$ 4 = \frac{20}{5} $$

- Subtract:

$$ \frac{20}{5} - \frac{16}{5} = \frac{4}{5} $$

- Multiply by 8:

$$ 8 \times \frac{4}{5} = \frac{8 \times 4}{5} = \frac{32}{5} $$

Right Side:

Calculate:

$$ 2 \times \frac{16}{5} = \frac{2 \times 16}{5} = \frac{32}{5} $$

Both sides are equal:

$$ \frac{32}{5} = \frac{32}{5} $$

Since the left and right sides are equal, a = 16/5 is a valid solution.

Alternative Solution: Checking with the Decimal 3.2

The decimal equivalent of 16/5 is 3.2. Let's verify this as well.

1. Substitute a = 3.2 into the original equation

$$ 8(4 - 3.2) = 2 \times 3.2 $$

2. Simplify both sides

Left Side:

Calculate $4 - 3.2$:

$$ 4 - 3.2 = 0.8 $$

Multiply by 8:

$$ 8 \times 0.8 = 6.4 $$

Right Side:

$$ 2 \times 3.2 = 6.4 $$

Both sides equal 6.4, confirming that a = 3.2 is also a valid solution.

Conclusion: Validating Multiple Forms of the Solution

By substituting both 16/5 and 3.2 into the original equation, we verified that both are correct solutions since they satisfy the equation. This demonstrates that:

- Fractions and decimals representing the same value can both be valid solutions.
- Checking the solution involves plugging the value back into the original equation to verify equality.
- The process confirms the accuracy of the solutions derived.

Additional Tips for Checking Solutions Effectively

- Always rewrite fractions as decimals or vice versa to compare easily.
- Double-check your arithmetic during substitution to avoid calculation errors.
- Understand that multiple solutions can exist, especially in equations with variables on both sides.

- Practice substituting solutions into various equations to build confidence.

- Remember, the goal of checking is to ensure the solution truly satisfies the original problem, not just to find an answer.

Summary

Checking solutions in algebra is a critical skill that ensures your answers are correct. In the case of 8(4 - a) = 2a, substituting a = 16/5 or 3.2 into the original equation confirms that both are valid solutions. The process involves:

- Replacing the variable with the proposed solution.
- Simplifying both sides.
- Comparing the results to see if they are equal.

This step not only verifies correctness but also deepens your understanding of algebraic relationships.

Final Thoughts

Being thorough in checking your solutions is a fundamental part of mastering algebra. It helps catch errors early and reinforces your comprehension of how equations work. Remember, whether you're working with fractions, decimals, or whole numbers, the principle remains the same: always verify your solutions by substitution.

By following the steps outlined above, you can confidently confirm whether your solutions are correct, giving you assurance in your mathematical work and preparing you for more complex problems ahead.

Frequently Asked Questions

How can I verify if the solution 3.2 (or 16/5) satisfies the equation 8(4 - a) = 2a?

To check, substitute a = 3.2 into the original equation: left side is 8(4 - 3.2) = 8(0.8) = 6.4; right side is 2 3.2 = 6.4. Since both sides are equal, the solution 3.2 is correct.

What steps should I follow to verify a solution to the equation 8(4 - a) = 2a?

First, substitute the proposed solution into the original equation. Calculate both sides separately; if they are equal, the solution is verified. For example, with a=3.2, both sides equal 6.4, confirming the solution is correct.

Is checking the solution by substitution a reliable method for verifying answers in equations like 8(4 - a) = 2a?

Yes, substituting the proposed solution back into the original equation is a reliable way to verify its correctness because it directly tests whether the value satisfies the equation.

How do I interpret the check when the left and right sides of the equation are equal after substitution?

If, after substituting the solution, both sides of the equation produce the same value, it confirms that the solution is correct and satisfies the original equation.

What common mistakes should I avoid when checking a solution to an equation like 8(4 - a) = 2a?

Avoid errors such as incorrect substitution, miscalculating the expressions, or forgetting to simplify both sides fully. Always double-check your arithmetic to ensure accuracy when verifying solutions.

Additional Resources

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In the world of mathematics, solving equations is only part of the process; verifying the solutions is equally crucial to ensure their accuracy. When presented with an equation like 8(4 - a) = 2a and proposed solutions such as 16/5 or 3.2, the important step is to check whether these values truly satisfy the original equation. This process not only confirms correctness but also deepens understanding of the solving procedure. This article aims to guide readers through the detailed process of solution checking, illustrating how to verify whether given solutions are valid, and why this step is essential in mathematical problem-solving.

Understanding the Equation: What Are We Dealing With?

Before jumping into solution verification, it's vital to understand the structure of the given equation:

8(4 - a) = 2a

This is a linear equation with one variable, 'a'. The goal is to find the value(s) of 'a' that satisfy the equation—meaning, when substituted back into the original, both sides should be equal.

The two proposed solutions are:

- 16/5, which simplifies to 3.2
- 3.2 itself

Since both are numerically identical, the core question is: Do these values satisfy the equation? To answer this, we'll perform substitution and check whether both sides are equal.

The Importance of Checking Solutions: Why Verification Matters

Mathematics isn't just about finding an answer; it's about confirming that the answer is correct within the problem's context. Here’s why verification is crucial:

- Detecting Calculation Errors: Mistakes during algebraic manipulation can lead to incorrect solutions. Verification helps catch these errors.
- Ensuring Validity: Sometimes, solutions obtained algebraically are extraneous—meaning they satisfy the manipulated equation but not the original.
- Building Confidence: Confirming solutions boosts confidence in problem-solving skills and understanding.

In practical scenarios, especially in real-world applications, verifying solutions ensures that decisions based on mathematical models are reliable.

Step-by-Step Process for Checking Solutions

Let's elaborate on the systematic approach to verify whether a proposed solution satisfies the original equation.

1. Substitute the Proposed Solution into the Equation

For each candidate value of 'a', replace 'a' with that value in both sides of the equation.

2. Calculate Each Side

Perform the calculations carefully, following order of operations (PEMDAS/BODMAS).

3. Compare the Results

If both sides are equal after substitution and calculation, the solution is valid; otherwise, it’s invalid.

Practical Application: Checking the Proposed Solutions

Now, let's apply this process explicitly to the solutions 16/5 and 3.2.

Solution 1: a = 16/5 (or 3.2)

Step 1: Substitute into the original equation

Original equation:

$8(4 - a) = 2a$

Substitute a = 16/5

Step 2: Calculate the left side

- First, compute (4 - a)

Since a = 16/5, convert 4 to a fraction with denominator 5:

4 = 20/5

So,

4 - a = 20/5 - 16/5 = (20 - 16)/5 = 4/5

- Next, multiply by 8:

8 (4/5) = (8 4)/5 = 32/5

Step 3: Calculate the right side

2a = 2 (16/5) = (2 16)/5 = 32/5

Step 4: Compare both sides

Left side: 32/5

Right side: 32/5

Since both sides are equal, a = 16/5 satisfies the equation.

Solution 2: a = 3.2

Step 1: Substitute into the original equation

- Convert 3.2 to fraction to maintain precision: 3.2 = 16/5 (as previously established)

- Alternatively, directly substitute 3.2:

a = 3.2

Step 2: Calculate the left side

- (4 - a) = 4 - 3.2 = 0.8

- Multiply by 8:

8 0.8 = 6.4

Step 3: Calculate the right side

2 3.2 = 6.4

Step 4: Compare

Left side: 6.4
Right side: 6.4

Both sides are equal, confirming that a = 3.2 also satisfies the original equation.

Confirming the Validity of the Solutions

Through detailed substitution, both proposed solutions—16/5 and 3.2—are verified to satisfy the original equation. This process demonstrates the importance of solution verification, especially when dealing

with fractional and decimal representations, as errors can often occur during algebraic manipulations or conversions.

Additional Notes on Solution Checking

- Multiple solutions: Some equations admit more than one solution; verifying each is necessary.
- Extraneous solutions: Particularly in equations involving roots or denominators, solutions might appear valid algebraically but violate the original equation or domain restrictions.
- Decimal vs. fractional forms: Confirming equivalence through substitution ensures that different representations represent the same value in the context of the problem.

Final Thoughts: Why Solution Verification Is a Key Step

In mathematics, discovering a potential solution is just the beginning. The real mastery lies in verifying whether that solution genuinely satisfies the problem's conditions. This process helps prevent errors, ensures accuracy, and builds a robust understanding of algebraic principles.

In the case of $8(4 - a) = 2a$, both $16/5$ and 3.2 have been shown through systematic substitution to be correct solutions. Whether working with fractions or decimals, the core verification process remains the same—substitute, calculate, and compare. This skill is invaluable not just in academic settings but also in real-world applications where accuracy is paramount.

By consistently applying these verification techniques, students and professionals alike can develop confidence in their solutions and avoid common pitfalls that can arise from oversight or miscalculation.

In summary:
- Always verify your solutions by substitution.

- Use precise calculations, especially with fractions and decimals.

- Confirm both sides of the original equation are equal after substitution.

- Recognize the importance of this step in ensuring correctness and understanding.

This disciplined approach to solution checking elevates problem-solving from mere calculation to a true demonstration of mathematical rigor.

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