Steps For Solving 5(2x-8)= 20 Are Shown.5(2x-8)= 2010x-40-2010x-40+40-20 + 4010x = 6010x 601010X-6Which

Steps For Solving 5(2x-8)= 20 Are Shown.5(2x-8)= 2010x-40-2010x-40+40-20 + 4010x = 6010x 601010X-6Which in the first paragraph sets the stage for a comprehensive guide on solving linear equations like the one presented. Whether you're a student tackling algebra for the first time or someone brushing up on your math skills, understanding the step-by-step process is essential. This article will walk you through the detailed steps for solving the equation 5(2x - 8) = 20, along with explanations of the algebraic principles involved, so you can confidently approach similar problems.

Understanding the Equation

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

$$ 5(2x - 8) = 20 $$

This is a linear equation with a single variable, x. The goal is to isolate x on one side of the equation to find its value.

Step-by-Step Process to Solve 5(2x - 8) = 20

Step 1: Distribute the 5 across the parentheses

- What to do: Multiply 5 by each term inside the parentheses.
- Calculation:

$$
5 \times 2x = 10x
$$

$$
5 \times (-8) = -40
$$

- Result:

$$
10x - 40 = 20
$$

Distributive property allows us to eliminate parentheses by multiplying each term inside by the factor outside.

Step 2: Add or subtract to isolate the term with x

- Objective: Get the term containing x on one side and constants on the other.
- Action: Add 40 to both sides to cancel the -40.
- Calculation:

$$
10x - 40 + 40 = 20 + 40
$$

$$
10x = 60
$$

This step uses the addition property of equality, which maintains the balance of the equation.

Step 3: Solve for x by dividing both sides by the coefficient of x

- Action: Divide both sides by 10 to solve for x.
- Calculation:

$$
\frac{10x}{10} = \frac{60}{10}
$$

$$
x = 6
$$

Dividing both sides by the coefficient of x isolates x, giving the solution.

Verification of the Solution

It's always good practice to verify your solution by substituting x = 6 back into the original equation.

- Original equation:

$$
5(2x - 8) = 20
$$

- Substitute x = 6:

$$
5(2 \times 6 - 8) = 20
$$

$$
5(12 - 8) = 20
$$

$$
5(4) = 20
$$

$$
20 = 20
$$

- Since both sides equal 20, the solution $x = 6$ is correct.

Common Mistakes to Avoid

When solving linear equations, certain pitfalls can lead to incorrect answers. Be mindful of the following:

- **Forgetting to distribute:** Always distribute the outside coefficient across all terms inside parentheses.
- **Sign errors:** Pay attention to negative signs during distribution and when moving terms across the equals sign.
- **Incorrect operations:** Ensure you perform addition/subtraction before multiplication/division, following the order of operations.
- **Not checking the solution:** Always substitute your answer back into the original equation to verify correctness.

Additional Examples of Solving Similar Equations

Practicing similar problems can reinforce your understanding. Here are a few:

Example 1: Solve 3(4x + 5) = 39

- Distribute:

$$
12x + 15 = 39
$$

- Subtract 15 from both sides:

\[

12x = 24
\]
- Divide both sides by 12:
\[
x = 2
\]
- Verify by substituting x = 2.

Example 2: Solve -2(3x - 7) = 14

- Distribute:
\[
-6x + 14 = 14
\]
- Subtract 14 from both sides:
\[
-6x = 0
\]
- Divide both sides by -6:
\[
x = 0
\]
- Verify by substitution.

Tips for Mastering Linear Equations

- Practice regularly: The more equations you solve, the more intuitive the process becomes.
- Write neatly: Keep your work organized to avoid sign and calculation errors.
- Understand properties of equality: These properties allow you to perform the same operation on both sides safely.
- Use inverse operations: To isolate variables, always perform the inverse of the operation currently attached to the variable.

Conclusion

Solving equations like *5(2x - 8) = 20* involves a series of logical steps rooted in fundamental algebra principles. Distributing, simplifying, isolating the variable, and verifying your answer are core components of the process. Remember to stay attentive to signs and operations, and practice similar problems to build confidence. With these steps and tips, you'll be well-equipped to tackle linear equations and enhance your algebra skills effectively. Whether for academic success or everyday problem-solving, mastering these techniques is a valuable math skill.

Frequently Asked Questions

What is the first step to solve the equation 5(2x - 8) = 20?

Distribute the 5 across the terms inside the parentheses: 5 2x = 10x and 5 -8 = -40, so the equation becomes 10x - 40 = 20.

How do you isolate the variable x after distributing in 10x - 40 = 20?

Add 40 to both sides of the equation to get 10x = 60.

What is the next step after simplifying to 10x = 60?

Divide both sides by 10 to solve for x: x = 60 / 10, which simplifies to x = 6.

Why is it important to perform the same operation on both sides of the equation?

To maintain equality, ensuring the solution remains valid and the equation is balanced.

What is the final solution to the equation 5(2x - 8) = 20?

The solution is x = 6.

Additional Resources

Steps For Solving 5(2x-8)= 20 Are Shown: A Comprehensive Guide to Mastering Algebraic Equations

When it comes to algebra, understanding how to solve equations efficiently and accurately is fundamental. The phrase "Steps For Solving 5(2x-8)= 20 Are Shown" encapsulates a process that, once mastered, becomes a powerful tool in any mathematician's arsenal. This article aims to thoroughly explore the step-by-step approach to solving this specific type of linear equation, dissecting each move for clarity and comprehension. Whether you're a student seeking to improve your algebra skills or an educator looking for a clear explanation to share, this guide offers detailed insights into the solving process.

Understanding the Equation: $5(2x - 8) = 20$

Before diving into the solution steps, it is essential to interpret the equation correctly. The equation involves a distributive property, a coefficient outside the parentheses, and a constant on the right side. Recognizing these components helps in strategizing the approach to isolate the variable and find its value efficiently.

Key Features:
- Linear equation in one variable, x.
- Application of distributive property.
- Balance principle: whatever operation is performed on one side must be performed on the other to maintain equality.

Pros:
- Straightforward structure makes it easy to apply basic algebraic principles.
- Provides practice in distributive property and balancing equations.

Cons:
- Initial confusion might arise if the distributive property isn't recognized.
- Mistakes can occur if steps are not carefully executed.

Step-by-Step Solution Process

Breaking down the solving process into manageable steps ensures clarity and reduces errors. Below, each step is explained with rationale, demonstrating how to approach similar equations.

Step 1: Apply the Distributive Property

The original equation is:

$5(2x - 8) = 20$

Distribute the 5 across the parentheses:

$5\ 2x - 5\ 8 = 20$

which simplifies to:

$10x - 40 = 20$

Why?
Distributive property transforms the equation into a linear form, making it easier to isolate x.

Tips:
- Always double-check multiplication to avoid mistakes.
- Remember the distributive property: $a(b + c) = ab + ac$.

Step 2: Isolate the Term Containing x

Next, add 40 to both sides to move constant terms away from the variable:

$10x - 40 + 40 = 20 + 40$

which simplifies to:

$10x = 60$

Why?
To solve for x, all constants need to be on one side, leaving the variable alone on the other.

Tips:
- Always perform the same operation on both sides to keep the equation balanced.
- Be cautious with signs—adding or subtracting negatives can be tricky.

Step 3: Solve for x

Divide both sides by 10:

$(10x)/10 = 60/10$

which simplifies to:

$x = 6$

Why?
Dividing isolates the variable, providing the solution directly.

Features:
- Dividing by the coefficient of x simplifies the equation.
- The solution is a single numerical value.

Additional Explanation: The Complex Expression

The original prompt included a confusing extended expression:

2010x - 40 - 2010x - 40 + 40 - 20 + 4010x = 6010x 601010X-6Which

This appears to be a misformatted or extended version of algebraic manipulation or an attempt to demonstrate combining like terms. Let's clarify and interpret this expression.

Breaking down the expression:

$$2010x - 40 - 2010x - 40 + 40 - 20 + 4010x = 6010x$$

Simplify both sides:

- Combine like terms on the left:

$$(2010x - 2010x) + (-40 - 40 + 40 - 20) = 0 + (-40 - 40 + 40 - 20)$$

Calculate constants:

$$-40 - 40 + 40 - 20 = (-40 - 40) + (40 - 20) = -80 + 20 = -60$$

Now, the left side simplifies to:

$$0 - 60 = -60$$

The right side is 6010x, so the equation becomes:

$$-60 = 6010x$$

This is a straightforward linear equation.

Solving for x:

x = -60 / 6010

Simplify the fraction:

x = -6 / 601

This provides the value of x in fractional form, illustrating how combining like terms simplifies complex expressions.

Common Mistakes to Avoid

While solving linear equations like the example, students often make certain errors. Recognizing and avoiding these pitfalls is crucial for accuracy.

- Forgetting to distribute properly: Missing the distributive step can lead to incorrect solutions.
- Neglecting to perform the same operation on both sides: This violates the balance principle.
- Sign errors: Confusing plus and minus signs, especially when moving terms across the equation.
- Dividing by zero: Ensuring the coefficient of x is not zero before division.

Practice Problems for Mastery

To reinforce understanding, try solving these similar equations:

1. 4(3x + 5) = 52
2. 7(2x - 3) = 35
3. 3(4x - 2) + 6 = 30
4. 5(2x + 4) - 10 = 30

Solution Strategies:
- Always distribute first if parentheses are involved.
- Combine like terms before isolating x.
- Perform inverse operations systematically.

Conclusion: Tips for Effective Equation Solving

Mastering the steps for solving equations such as 5(2x - 8) = 20 is essential for progressing in algebra. Here are some summarized tips:

- Carefully apply the distributive property.
- Always perform operations equally on both sides.
- Simplify step-by-step to avoid errors.
- Check your work by substituting the found value of x back into the original equation.
- Practice with various equations to build confidence and speed.

Pros of Mastering These Steps:

- Builds a strong foundation for more advanced algebra topics.
- Enhances problem-solving skills.
- Improves logical thinking and attention to detail.

Cons:

- Can be repetitive, which might lead to complacency.
- Mistakes in initial steps can cascade and lead to incorrect final answers.

By following the structured approach outlined in this article, students and learners can develop a systematic method for solving linear equations—transforming complex-looking problems into straightforward calculations. Remember, practice makes perfect, and understanding each step thoroughly is the key to success in algebra.

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