

Find The Value Of X $6x-11=37$ And $2(x+9)=147$

Find The Value Of X $6x-11=37$ And $2(x+9)=147$ — this is a common algebraic problem that students often encounter when learning to solve linear equations. Understanding how to find the value of X in such equations is fundamental to mastering algebra, which lays the groundwork for more advanced mathematics topics. In this comprehensive guide, we will explore step-by-step methods to solve these equations, discuss key concepts, and provide useful tips to enhance your problem-solving skills. Whether you're a student preparing for exams or someone looking to strengthen your algebraic reasoning, this article will serve as an invaluable resource.

Understanding the Basics of Algebraic Equations

Before diving into solving specific equations, it's important to understand some fundamental concepts in algebra:

What Are Algebraic Equations?

Algebraic equations are mathematical statements that show the equality of two expressions. These expressions often contain variables (like X) and constants. The goal is to find the value of the variable that makes the equation true.

Key Terms in Solving Equations

- Variable: A symbol, usually a letter, representing an unknown value.
- Constant: A fixed value.
- Coefficient: The number multiplied by the variable.
- Equation: A statement that two expressions are equal.

Step-by-Step Solution for $6x - 11 = 37$

This is a linear equation in one variable. Let's analyze how to find the value of X.

Step 1: Isolate the term containing X

The equation is:

$$6x - 11 = 37$$

To isolate $6x$, add 11 to both sides:

$$6x - 11 + 11 = 37 + 11$$

Simplifies to:

$$6x = 48$$

Step 2: Solve for X by dividing both sides by 6

Now, divide both sides by 6:

$$6x / 6 = 48 / 6$$

Simplifies to:

$$x = 8$$

Key Point:

- The solution to the equation $6x - 11 = 37$ is $x = 8$.

Step-by-Step Solution for $2(x + 9) = 147$

This equation involves a distributive property, which is crucial in algebra.

Step 1: Apply the distributive property

Distribute the 2 across the parentheses:

$$2x + 2 \cdot 9 = 147$$

Simplifies to:

$$2x + 18 = 147$$

Step 2: Isolate the term with X

Subtract 18 from both sides:

$$2x + 18 - 18 = 147 - 18$$

Simplifies to:

$$2x = 129$$

Step 3: Solve for X by dividing both sides by 2

Divide both sides by 2:

$$2x / 2 = 129 / 2$$

Simplifies to:

$$x = 64.5$$

Summary of Solutions

- Solution to $6x - 11 = 37$: $x = 8$
- Solution to $2(x + 9) = 147$: $x = 64.5$

Additional Tips for Solving Algebraic Equations

To enhance your understanding and efficiency when solving similar problems, consider these key tips:

1. Always perform the same operation on both sides of the equation

This principle ensures the equality remains valid. Whether adding, subtracting, multiplying, or dividing, do it to both sides.

2. Understand and apply the distributive property correctly

When an equation contains parentheses with a coefficient outside, distribute it carefully.

3. Simplify step-by-step

Breaking down complex equations into smaller, manageable steps reduces errors and improves clarity.

4. Check your solutions

Substitute the found value of X back into the original equation to verify correctness.

5. Practice with different types of equations

Work on various problems to strengthen your skills and recognize different solving strategies.

Common Mistakes to Avoid

While solving equations, be mindful of these common errors:

- Forgetting to perform the same operation on both sides
- Incorrect distribution of coefficients
- Miscalculations during addition, subtraction, multiplication, or division
- Not checking the solution in the original equation

Why Is Finding the Value of X Important?

Understanding how to find the value of X in equations like $6x - 11 = 37$ and $2(x + 9) = 147$ has practical applications across various fields:

1. **Educational Foundation:** Fundamental for algebra and higher mathematics courses.
2. **Real-World Problem Solving:** Used in finance, engineering, and science to model and solve problems involving unknown quantities.
3. **Critical Thinking Skills:** Enhances logical reasoning and analytical skills.

Advanced Topics Related to Solving Equations

Once comfortable with basic linear equations, you can explore:

1. Quadratic Equations

Equations where the highest power of the variable is 2, such as $ax^2 + bx + c = 0$.

2. Systems of Equations

Solving multiple equations simultaneously to find common solutions.

3. Inequalities

Mathematical statements involving inequalities ($>$, $<$, $\geq$, $\leq$) that require different solving techniques.

Conclusion

Mastering how to find the value of X in equations like $6x - 11 = 37$ and $2(x + 9) = 147$ is essential for progressing in algebra and beyond. By understanding the underlying principles, practicing step-by-step solutions, and avoiding common mistakes, you can confidently tackle a wide range of algebraic problems. Remember to verify your solutions and keep practicing different types of equations to strengthen your skills. Whether you're preparing for exams or applying algebra in real-world scenarios, these foundational skills will serve you well.

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Frequently Asked Questions

How do I find the value of x in the equation $6x - 11 = 37$?

Add 11 to both sides to get $6x = 48$, then divide both sides by 6 to find $x = 8$.

What is the value of x in the equation $2(x + 9) = 147$?

First, divide both sides by 2 to get $x + 9 = 73$. Then, subtract 9 from both sides to find $x = 64$.

Can I solve both equations for x simultaneously?

No, since each equation has its own variable and they are separate equations. You solve each independently to find its respective value of x .

What are the steps to solve the equation $6x - 11 = 37$?

Add 11 to both sides to get $6x = 48$, then divide both sides by 6 to find $x = 8$.

How do I verify my solutions for these equations?

Substitute the found value of x back into the original equations to see if both sides are equal, confirming your solution is correct.

Additional Resources

Find The Value Of X $6x-11=37$ And $2(x+9)=147$

Mathematics often serves as the backbone of logical reasoning and problem-solving skills, underpinning countless applications in everyday life, science, technology, and engineering. Among the foundational concepts in math are algebraic equations—equations that involve variables, often represented by letters like x , which stand for unknown quantities. Solving for x in various equations is a critical skill that enhances analytical thinking and problem-solving capabilities. Today, we explore two such equations: $6x - 11 = 37$ and $2(x + 9) = 147$. The process of finding x in these equations not only sharpens algebraic techniques but also exemplifies systematic approaches to solving similar problems.

Understanding the Equations: A Foundation for Solution

Before diving into the solution process, it's essential to understand what these equations represent and how they relate to real-world problem-solving.

Equation 1: $6x - 11 = 37$

This is a linear algebraic equation involving a single variable x . The equation states that when six times x is decreased by 11, the result is 37. Such equations often model situations where a quantity is scaled, shifted, and set equal to a known value—common in financial calculations, physics, and many engineering contexts.

Equation 2: $2(x + 9) = 147$

This equation involves a binomial expression within parentheses, multiplied by 2, and equated to 147. It reflects scenarios where a combined quantity (represented by $x + 9$) is scaled and matched to a specific total. The structure suggests the need to distribute multiplication over the parentheses and then isolate x .

Methodology for Solving Algebraic Equations

To find the value of x in each equation, certain algebraic principles and steps are universally applied:

- Isolate the variable: Get all terms containing x on one side of the equation and constants on the

other.

- Simplify both sides: Use basic arithmetic operations to reduce the equation to a simpler form.
- Perform inverse operations: Use addition/subtraction and multiplication/division to solve for x.
- Check the solution: Substitute the found value back into the original equation to verify correctness.

Applying these steps systematically ensures accurate solutions and develops a structured problem-solving approach.

Solving the First Equation: $6x - 11 = 37$

Let's walk through the solution process for this equation step by step.

Step 1: Add 11 to both sides

To isolate the term with x, first eliminate the constant term on the left:

$$6x - 11 + 11 = 37 + 11$$

Simplifies to:

$$6x = 48$$

Step 2: Divide both sides by 6

Next, divide both sides by the coefficient of x:

$$6x / 6 = 48 / 6$$

Which simplifies to:

$$x = 8$$

Step 3: Verify the solution

Plug $x = 8$ back into the original equation:

$$6(8) - 11 = ?$$

Calculates as:

$$48 - 11 = 37$$

Since the left side equals the right side, $x = 8$ is indeed the correct solution.

Solving the Second Equation: $2(x + 9) = 147$

This equation involves an expression within parentheses, necessitating distribution and then solving for x .

Step 1: Divide both sides by 2

To simplify, divide both sides by 2:

$$2(x + 9) / 2 = 147 / 2$$

This yields:

$$x + 9 = 73.5$$

Note: While fractions are common in algebra, if the context requires, you could also keep the fractional form, but here, decimal form simplifies calculations.

Step 2: Subtract 9 from both sides

Isolate x :

$$x + 9 - 9 = 73.5 - 9$$

Simplifies to:

$$x = 64.5$$

Step 3: Verify the solution

Substitute $x = 64.5$ into the original equation:

$$2(64.5 + 9) = ?$$

Calculate inside parentheses:

$$64.5 + 9 = 73.5$$

Then multiply:

$$2 \cdot 73.5 = 147$$

Since the result matches the right side, the solution $x = 64.5$ is confirmed.

Summary of Solutions and Key Takeaways

- The value of x in the first equation $6x - 11 = 37$ is 8.
- The value of x in the second equation $2(x + 9) = 147$ is 64.5.

These solutions exemplify core algebraic techniques such as:

- Adding or subtracting constants to both sides to isolate terms.
- Dividing or multiplying to solve for the variable.
- Distributing multiplication over parentheses when necessary.
- Verifying solutions by substitution.

The process underscores the importance of systematic strategy and careful arithmetic, essential skills not only in academic contexts but also in practical problem-solving across various domains.

Broader Implications and Applications

While these equations may seem straightforward, the methods used to solve them are fundamental to more complex algebraic problems and real-world applications:

- Financial calculations: Determining unknown quantities such as interest rates, loan payments, or profit margins.
- Physics: Calculating unknown variables like velocity, force, or energy.
- Engineering: Designing systems where variables must meet specific constraints.
- Data analysis: Fitting models and solving for parameters.

Understanding how to manipulate and solve equations like these empowers individuals to approach complex problems with confidence, analytical rigor, and clarity.

Conclusion

Mathematics, especially algebra, forms the language through which we interpret and solve many of life's problems. By mastering the process of finding the value of x in equations such as $6x - 11 = 37$ and $2(x + 9) = 147$, learners develop essential logical skills and a disciplined approach to problem-

solving. Whether in academic pursuits or real-world scenarios, these techniques serve as foundational tools, enabling us to decode the relationships between quantities and make informed decisions. As you continue exploring algebra, remember that each problem is an opportunity to sharpen your analytical skills, fostering a mindset of clarity, precision, and confidence.

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