

What Is The Sum Of 21 And 5 Times A Number F Is 61

What Is The Sum Of 21 And 5 Times A Number F Is 61

Understanding the problem "What is the sum of 21 and 5 times a number f is 61" involves translating a word problem into a mathematical equation and then solving for the unknown variable, f . This kind of problem is common in algebra and helps develop problem-solving skills that are essential for more advanced mathematics. In this article, we will explore how to interpret this problem, formulate the equation, solve for the variable, and understand the broader applications of such algebraic problems.

Understanding the Problem Statement

Before jumping into the solution, it's vital to interpret what the problem is asking. The phrase "What is the sum of 21 and 5 times a number f is 61" can be broken down into parts:

- "Sum of 21 and 5 times a number f " refers to adding 21 to five times a certain number, f .
- "is 61" indicates that this sum equals 61.

This description leads us to formulate an algebraic expression that captures the relationship described.

Formulating the Mathematical Equation

The key to solving this problem is translating the words into a mathematical equation:

Step 1: Identify the knowns and unknowns

- Known: 21 (a constant), 61 (the total sum)
- Unknown: f (the number we need to find)

Step 2: Express the phrase mathematically

- "5 times a number f " becomes $5f$.
- "Sum of 21 and $5f$ " becomes $21 + 5f$.

Step 3: Set up the equation

Since this sum equals 61, the equation is:

$$21 + 5f = 61$$

This is a straightforward linear equation that can be solved to find the value of f .

Solving the Equation for f

Now that we have the equation, the next step is to solve for f using algebraic methods.

Step 1: Isolate the term with f

Subtract 21 from both sides of the equation:

$$21 + 5f = 61$$

$$5f = 61 - 21$$

$$5f = 40$$

Step 2: Divide both sides by 5

$$f = \frac{40}{5}$$

$$f = 8$$

Answer: The value of f is 8.

Understanding the Solution

The problem has been simplified to an algebraic equation, and solving it involves basic operations of addition, subtraction, and division. The key points to understand include:

- Interpreting words into mathematical expressions.
- Setting up correct equations based on problem statements.
- Applying algebraic operations to isolate the unknown variable.

Knowing how to translate real-world problems into equations is a fundamental skill in mathematics, essential for solving everyday problems, engineering, finance, and more.

Applications of Similar Algebraic Problems

Problems like "What is the sum of 21 and 5 times a number f is 61?" are foundational in understanding linear equations. These problems appear across various fields:

Key applications include:

- Financial calculations: Determining interest rates, loan payments, or investments based on certain constraints.
- Physics: Calculating distances, speeds, or forces when related linearly.
- Statistics: Setting up equations for data analysis.
- Economics: Modeling supply and demand with linear relationships.
- Engineering: Designing systems based on linear parameters.

Common types of similar problems:

- Finding an unknown quantity given a linear relationship.
- Solving word problems involving proportions and ratios.
- Determining the value of variables in systems of equations.

Step-by-Step Guide to Solving Similar Word Problems

To effectively approach problems like this, follow these steps:

1. **Read carefully:** Understand what the problem is asking.
2. **Identify knowns and unknowns:** Highlight constants and variables.
3. **Create an equation:** Convert words into a mathematical expression.
4. **Solve the equation:** Use algebraic methods to find the unknown.
5. **Verify the solution:** Substitute the value back into the original problem to confirm correctness.

Example:

Suppose you are asked: "If the sum of 15 and twice a number x is 25, what is x ?"

- Translate: $15 + 2x = 25$
- Solve: $2x = 25 - 15 = 10$
- $x = \frac{10}{2} = 5$

Common Mistakes to Avoid

While solving such problems, be mindful of the following common errors:

- Misinterpreting the problem statement: Ensure that the words are accurately translated into the correct mathematical expressions.
- Incorrect operations: Always perform inverse operations carefully to isolate the variable.
- Sign errors: Pay attention to signs when moving terms across the equality.
- Not checking the solution: Verify your answer by substituting it back into the original equation.

Importance of Mastering Algebraic Word Problems

Mastering problems like "What is the sum of 21 and 5 times a number f is 61?" is crucial because:

- It enhances logical thinking and problem-solving skills.
- It prepares you for more complex topics in mathematics and science.
- It provides tools to analyze and interpret real-world scenarios.
- It builds confidence in handling quantitative data.

Conclusion

In conclusion, the problem "What is the sum of 21 and 5 times a number f is 61" is a classic example of an algebraic word problem that involves translating language into an equation, solving for an unknown, and verifying the solution. Through systematic steps—formulating the equation, isolating the variable, and performing arithmetic—you find that the value of f is 8.

Understanding and practicing such problems are fundamental in developing

mathematical literacy and applying algebra to real-life situations. Whether in academics, professional fields, or everyday decision-making, the ability to solve linear equations efficiently is an invaluable skill. Keep practicing similar problems to strengthen your algebraic reasoning and problem-solving capabilities.

Keywords for SEO optimization:

- Algebra word problems
- Solve for the unknown f
- Linear equations
- Mathematical problem solving
- Algebra practice problems
- How to solve algebraic equations
- Word problem translation
- Basic algebra skills
- Solving equations step-by-step
- Real-world math applications

Frequently Asked Questions

What is the mathematical equation for 'What is the sum of 21 and 5 times a number F is 61'?

The equation is $21 + 5F = 61$.

How do I solve for the number F in the equation $21 + 5F = 61$?

Subtract 21 from both sides to get $5F = 40$, then divide both sides by 5 to find $F = 8$.

What is the value of F in the equation $21 + 5F = 61$?

The value of F is 8.

Can you explain the steps to solve for F in the equation $21 + 5F = 61$?

Yes. First, subtract 21 from both sides: $5F = 40$. Then, divide both sides by 5: $F = 8$.

Is the problem 'What is the sum of 21 and 5 times a number F is 61' an algebraic equation?

Yes, it is an algebraic equation used to find the value of the unknown number F.

How can I verify the solution $F = 8$ in the original problem?

Substitute $F = 8$ back into the original equation: $21 + 5(8) = 21 + 40 = 61$, which confirms the solution is correct.

Additional Resources

Mathematical Equation Analysis

Understanding the Equation: What Is The Sum Of 21 And 5 Times A Number F Is 61

When encountering a mathematical statement like "the sum of 21 and 5 times a number F is 61," it might appear straightforward at first glance, but it opens the door to various layers of understanding and problem-solving strategies. In this article, we will dissect this statement thoroughly, interpret its components, and explore how to formulate and solve the corresponding algebraic equation. As a seasoned mathematical expert, I will guide you through each step, ensuring clarity and depth in your comprehension.

Breaking Down the Statement: Components and Meaning

The phrase "the sum of 21 and 5 times a number F is 61" can be interpreted as a descriptive sentence that conveys a specific algebraic relationship. To understand it fully, we need to analyze each part:

1. The Sum

The word "sum" indicates addition. It signifies that two quantities are combined to produce a total.

2. The Numbers Involved

- The fixed number 21
- The variable component "5 times a number F" – which translates algebraically to $5 \times F$ or $5F$

3. The Result

The sum of these two parts equals 61.

Formulating the Algebraic Equation

Based on the interpretation above, we can translate the statement into an algebraic equation systematically.

1. Representing the Variable

Let F be the unknown number we aim to find.

2. Expressing "5 times a number F"

This is straightforward: $5F$

3. Summing 21 and $5F$

The sum is: $21 + 5F$

4. Setting the sum equal to 61

This leads to the algebraic equation:

$$21 + 5F = 61$$

This equation encapsulates the original statement in a precise mathematical form, enabling us to proceed with solving for F .

Solving the Equation: Step-by-Step Approach

Now that we have the algebraic expression, let's explore the solution process in detail. Understanding each step helps reinforce algebraic manipulation skills and clarifies the reasoning behind each move.

Step 1: Isolate the term involving F

Subtract 21 from both sides to move constant terms to the right:

$$21 + 5F = 61$$

Subtract 21:

$$5F = 61 - 21$$

Calculate:

$$5F = 40$$

Step 2: Solve for F

Divide both sides of the equation by 5:

$$F = 40 / 5$$

Calculate:

$$F = 8$$

Result: The value of F that satisfies the original statement is 8.

Interpreting the Solution: What Does $F = 8$ Mean?

The solution $F = 8$ has broader implications beyond the algebraic result. Let's explore what this means in practical or contextual terms.

Practical Interpretation

- If you interpret F as a number in a real-world scenario, such as the number of items, units, or quantities, then 8 is the specific value that makes the original statement true.
- Plugging this back into the original expression:

Sum of 21 and 5 times 8:

$$21 + 5 \times 8 = 21 + 40 = 61$$

Which confirms the correctness of the solution.

Alternative Perspectives

- The problem demonstrates the power of algebra in translating word problems into equations.
- It showcases how simple steps—adding, subtracting, dividing—are essential tools in problem-solving.

Expanding the Understanding: Why Is This Important?

While at first glance, this might seem like a basic algebra problem, its significance extends into various domains:

1. Critical Thinking and Logical Reasoning

Transforming a word problem into an algebraic expression sharpens the ability to think critically about relationships between quantities.

2. Foundation for Advanced Mathematics

Understanding such foundational problems is crucial for tackling more complex equations, inequalities, and even real-world applications involving finance, engineering, or data analysis.

3. Application in Real-Life Scenarios

For example, if F represented a quantity such as the number of items to be purchased, and the total cost or sum was 61, this approach helps in determining the unknown quantity efficiently.

Common Mistakes and Pitfalls to Avoid

Even in straightforward problems like this, learners often encounter pitfalls. Recognizing these helps develop better problem-solving skills.

List of Common Errors:

- Misinterpreting the phrase "5 times a number" as $5 + F$ instead of $5F$.
- Incorrectly setting up the equation, such as reversing the order or misplacing constants.
- Forgetting to perform inverse operations, such as subtracting 21 before dividing.
- Ignoring the importance of verifying the solution by substituting $F = 8$ back into the original expression.

Tips to Avoid Mistakes:

- Carefully read and interpret each part of the problem.
- Write down the algebraic equation explicitly before solving.
- Check your work by substitution.

Applying the Knowledge: Extending to Similar Problems

The process used here can be adapted to a variety of similar scenarios. For instance:

- If the problem states, "the sum of 15 and 4 times a number G is 49," the setup is:

$$15 + 4G = 49$$

Solving for G:

$$4G = 49 - 15 = 34$$

$$G = 34 / 4 = 8.5$$

- For a problem like, "the sum of 10 and 3 times a number H is 37," the equation:

$$10 + 3H = 37$$

Solving:

$$3H = 37 - 10 = 27$$

$$H = 27 / 3 = 9$$

This demonstrates how the core principles of algebra—setting up equations and performing inverse operations—are universally applicable.

Conclusion: The Significance of the Equation "21 + 5F = 61"

In this detailed exploration, we've taken a seemingly simple statement and

unpacked it into its algebraic essence. By translating the verbal description into the equation " $21 + 5F = 61$," we unlocked a straightforward solution process leading to $F = 8$.

This process underscores several key takeaways:

- The importance of precise interpretation of word problems.
- The power of algebra in solving real-world and abstract problems.
- The necessity of systematic problem-solving strategies, such as isolating variables and verifying solutions.

Understanding and mastering such foundational problems builds a solid mathematical framework, empowering you to approach more complex challenges with confidence. Whether you're a student, educator, or enthusiast, recognizing the elegance and utility of these basic algebraic principles is essential for advancing in mathematics and related fields.

In essence, the equation "the sum of 21 and 5 times a number F is 61" exemplifies how language and mathematics intertwine, illustrating the beauty and utility of algebraic thinking in everyday problem-solving.

[What Is The Sum Of 21 And 5 Times A Number F Is 61](#)

What Is The Sum Of 21 And 5 Times A Number F Is 61

Related Articles

- [What Type Of Parent Function Is \$F\(x\) = 1/x\$](#)
- [What Represents The Inverse Of The Function \$F\(x\)=4x\$?](#)
- [In The Diagram , What Is The Value Of X](#)

[Back to Home](#)