

Select The Correct Answer. The Sum Of Two Consecutive Numbers Is 157. This Equation, Where N Is The First

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Understanding basic algebraic concepts is essential for solving many everyday problems, especially when dealing with sequences and series of numbers. One common type of problem involves finding two consecutive numbers based on their sum or difference. In this article, we will explore how to approach such problems, particularly focusing on the question where the sum of two consecutive numbers equals 157, with the first number represented by the variable N .

Understanding the Problem

Breaking Down the Question

The problem states: "Select the correct answer. The sum of two consecutive numbers is 157. This equation, where N is the first." To interpret this, we need to understand:

- What are consecutive numbers?
- How to model the problem mathematically.
- How to define the variables involved.

What Are Consecutive Numbers?

Consecutive numbers are numbers that follow each other in order, without any gaps. For example:

- 3 and 4
- 10 and 11
- 100 and 101

In general, for any integer N , the next consecutive number is $N + 1$.

Representing the Numbers Mathematically

Given that N is the first number:

- The first number: N
- The second number: $N + 1$

The problem asks for the sum of these two numbers, which is given as 157.

Formulating the Equation

Setting Up the Mathematical Expression

Based on the problem:

- Sum of the two numbers = 157
- First number = N
- Second number = $N + 1$

Therefore, the equation can be written as:

$$N + (N + 1) = 157$$

Simplifying the Equation

Let's simplify:

$$\begin{aligned} N + N + 1 &= 157 \\ 2N + 1 &= 157 \end{aligned}$$

This is a linear equation that can be solved for N .

Solving the Equation

Step-by-Step Solution

To find the value of N :

1. Subtract 1 from both sides:

$$\begin{aligned} 2N + 1 - 1 &= 157 - 1 \\ 2N &= 156 \end{aligned}$$

2. Divide both sides by 2:

$$\begin{aligned} N &= \frac{156}{2} = 78 \end{aligned}$$

Interpreting the Result

- The first number, N , is 78.
- The second number, $N + 1$, is $78 + 1 = 79$.

Verifying the Solution

Check the Sum

Add the two numbers:

$$\begin{aligned} & \backslash \\ & 78 + 79 = 157 \\ & \backslash \end{aligned}$$

Since the sum matches the given condition, our solution is correct.

Conclusion

The two consecutive numbers that sum to 157 are 78 and 79, with N being 78.

Additional Considerations and Variations

What If the Sum Was Different?

Suppose the sum was some other number, say S , then the general form would be:

$$\begin{aligned} & \backslash \\ & N + (N + 1) = S \\ & \backslash \end{aligned}$$

which simplifies to:

$$\begin{aligned} & \backslash \\ & 2N + 1 = S \\ & \backslash \end{aligned}$$

and solving for N :

$$\begin{aligned} & \backslash \\ & N = \frac{S - 1}{2} \\ & \backslash \end{aligned}$$

Handling Negative Consecutive Numbers

If the problem involved negative numbers, the same method applies. For example, if the sum of two consecutive numbers is -157, then:

$$\begin{aligned} & \backslash \\ & N + (N + 1) = -157 \\ & \backslash \end{aligned}$$

which simplifies to:

$$2N + 1 = -157$$

and solving gives:

$$N = \frac{-157 - 1}{2} = \frac{-158}{2} = -79$$

Thus, the consecutive numbers are -79 and -78.

Summary of Key Points

- Consecutive numbers are numbers that follow each other directly, with a difference of 1.
- The sum of two consecutive numbers can be modeled with a simple linear equation.
- Assigning N as the first number, the second is $N + 1$.
- The equation for the sum is: $N + (N + 1) = \text{Sum}$.
- Solving the equation involves combining like terms and isolating N .
- The specific solution for the problem where the sum is 157 yields $N = 78$, with the numbers 78 and 79.

Practice Problems

To reinforce understanding, consider practicing with similar problems:

1. Find two consecutive numbers whose sum is 101.
2. If the sum of two consecutive numbers is -45, what are the numbers?
3. For a sum of 200, what are the two consecutive numbers?

Conclusion

Understanding how to model and solve problems involving consecutive numbers is a fundamental skill in algebra. By representing the numbers with variables and constructing equations based on given conditions, students can effectively find solutions to a variety of related problems. In the specific case of the sum being 157, the solution $N = 78$ and its consecutive number 79 demonstrate the straightforward nature of these algebraic techniques.

Whether dealing with positive or negative integers, the approach remains consistent: define variables, set up the equation, simplify, and solve. Mastery of these steps enhances problem-solving confidence and prepares students for more complex algebraic challenges.

Frequently Asked Questions

If N is the first of two consecutive numbers whose sum is 157, what is the value of N?

$N = 78$

What are the two consecutive numbers if their sum is 157 and N is the first?

78 and 79

How do you set up the equation for the sum of two consecutive numbers where N is the first?

$N + (N + 1) = 157$

What is the step to find the value of N in the equation $N + (N + 1) = 157$?

Combine like terms to get $2N + 1 = 157$, then solve for N.

What is the value of N after solving the equation $2N + 1 = 157$?

$N = 78$

Are the two numbers 78 and 79 consecutive numbers that sum to 157?

Yes, $78 + 79 = 157$

What is the importance of understanding consecutive numbers in solving this problem?

It helps set up the correct equation and find the solution efficiently.

Can this problem be solved using substitution? If yes, how?

Yes, by expressing the second number as $N + 1$ and substituting into the sum equation.

What is the general approach to solving problems involving the sum of consecutive numbers?

Set up an algebraic equation based on the first number, then solve for the unknown.

Additional Resources

Select The Correct Answer. The Sum Of Two Consecutive Numbers Is 157. This Equation, Where N Is The First

In the realm of mathematics, problems involving consecutive numbers often serve as foundational exercises for developing algebraic reasoning and problem-solving skills. One such classic problem states: "Select the correct answer. The sum of two consecutive numbers is 157. This equation, where N is the first, is to be analyzed and solved." While seemingly straightforward, this problem encapsulates key concepts in algebra, number theory, and logical reasoning. In this comprehensive review, we will explore the mathematical principles involved, methodology for solving the problem, common pitfalls, and implications for mathematical education and problem-solving strategies.

Understanding the Problem

The core of the problem is to find two consecutive numbers whose sum equals 157, with the additional parameter that the first of these numbers is represented as N .

Restating the problem:

- The two numbers are consecutive, meaning they differ by 1.
- Their sum equals 157.
- The first number is denoted as N .
- The second number, therefore, is $N + 1$.

The goal: Determine the value of N and the second number, and verify the correctness of the solution.

Mathematical Formulation

Setting up the Equation

Given the problem statements, the algebraic equation can be formulated as:

$$N + (N + 1) = 157$$

This equation captures the essence of the problem: the sum of the first number (N) and the next consecutive number (N + 1) equals 157.

Expanding and Simplifying

Expanding the equation:

$$N + N + 1 = 157$$

Combining like terms:

$$2N + 1 = 157$$

Subtract 1 from both sides:

$$2N = 156$$

Divide both sides by 2:

$$N = 78$$

This calculation indicates that the first number is 78.

The second number, being consecutive, is:

$$N + 1 = 78 + 1 = 79$$

Verifying the Solution

Verification is a critical component of problem-solving in mathematics. The values obtained should satisfy the original conditions.

Sum of the two numbers:

$$78 + 79 = 157$$

The sum matches the given condition, confirming the solution's correctness.

Alternative Approaches and Generalizations

While the algebraic approach is direct and efficient, alternative methods can reinforce understanding or provide insights into similar problems.

Using Logical Reasoning

- Recognize that since the sum is 157 and the numbers are consecutive, the average of these two numbers is:

$$\text{Average} = \text{Sum} / 2 = 157 / 2 = 78.5$$

- Since the numbers are consecutive integers, they are symmetric around this average; one is 0.5 less, and the other is 0.5 more than the average.

- Therefore:

$$\text{First number: } 78.5 - 0.5 = 78$$

$$\text{Second number: } 78.5 + 0.5 = 79$$

This aligns with the algebraic solution.

Generalization to Other Sums

- For two consecutive numbers summing to a number S , the first number N can be found as:

$$N = (S - 1) / 2$$

- The second number: $N + 1$
- This formula applies generally and can be used for any sum involving two consecutive numbers.

Common Challenges and Pitfalls

While this problem appears straightforward, several common pitfalls can occur:

- Misinterpretation of "consecutive": Assuming the numbers are not necessarily positive or integers, which affects the formulation.

- Incorrect algebraic setup: For example, forgetting to include the "+1" in the second number, leading to errors.
- Sign errors: Misplacing negative signs or miscalculating the division step.
- Overcomplicating the problem: Using unnecessary methods when a simple algebraic approach suffices.

Understanding these pitfalls emphasizes the importance of clear problem interpretation and systematic solution strategies.

Implications for Educational Practice

Problems like "The sum of two consecutive numbers is 157" serve as effective educational tools for illustrating fundamental concepts:

- Algebraic modeling: Translating word problems into equations.
- Arithmetic reasoning: Recognizing patterns and relationships between numbers.
- Problem-solving frameworks: Developing a step-by-step approach.
- Critical thinking: Verifying solutions and considering alternative methods.

Incorporating such problems into curricula enhances students' understanding of algebra and their ability to apply mathematical reasoning to real-world scenarios.

Conclusion: The Significance of the Problem and Its Solution

The problem of finding two consecutive numbers whose sum is 157 exemplifies a fundamental algebraic task that combines reasoning, equation setup, and verification. The solution, $N = 78$ and $N + 1 = 79$, not only satisfies the original condition but also illustrates key principles such as the importance of defining variables, constructing accurate equations, and verifying solutions.

Furthermore, this problem underscores the value of simplicity and clarity in mathematical problem-solving. Whether used as a teaching tool or a test of analytical skills, problems like this reinforce core mathematical concepts that underpin more complex reasoning.

The broader implication is that mastery of such foundational problems equips learners with essential skills for tackling advanced topics in mathematics, science, engineering, and everyday decision-making. Recognizing the patterns, formulating equations, and verifying solutions are universal skills

that transcend the classroom, making problems like this both educationally valuable and practically relevant.

In summary, the problem "Select The Correct Answer. The Sum Of Two Consecutive Numbers Is 157" exemplifies essential algebraic techniques and critical thinking. Its solution demonstrates how a straightforward equation can unlock understanding and reinforce foundational mathematical principles, serving as a stepping stone toward greater mathematical literacy and problem-solving proficiency.

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