

WILL MARK BRAINLIEST One Number Is 0.9 Of Another Number. Their Sum Is 0.038. Find Each Number.

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Understanding how to solve problems involving relationships between numbers, especially when one number is a fraction or a multiple of another, is a fundamental aspect of algebra. The problem at hand involves two numbers with a specific relationship: one is 0.9 times the other, and their sum is 0.038. Finding these numbers requires translating the problem into algebraic equations and solving them systematically.

In this article, we will explore the step-by-step process to find both numbers, understand the underlying principles, and reinforce problem-solving techniques used in algebra.

Understanding the Problem

Before diving into the solution, it is crucial to interpret the problem accurately.

Restating the problem

- One number is 0.9 times another number.
- The sum of these two numbers is 0.038.
- Find both numbers.

Key points

- Relationship between the numbers: one is a multiple of the other.
- The sum of the numbers: a simple addition problem.
- The numbers are likely to be small, given their sum.

Setting Up Variables

To solve the problem algebraically, assign variables to the unknowns.

Choosing variables

- Let the smaller or first number be (x) .
- Since the second number is 0.9 times the first, it can be expressed as $(0.9x)$.

Forming the equation

- The sum of the two numbers: $(x + 0.9x = 0.038)$.

This equation will be the basis for solving the problem.

Solving the Equation

Now, we focus on solving the algebraic equation derived from the problem.

Step 1: Combine like terms

- $(x + 0.9x = 1.9x)$.

Step 2: Set up the equation

- $(1.9x = 0.038)$.

Step 3: Isolate (x)

- $(x = \frac{0.038}{1.9})$.

Step 4: Perform the division

- Calculate (x) :

$$x = \frac{0.038}{1.9}$$

To compute this, divide numerator and denominator appropriately.

Calculating the Values of the Numbers

Let's proceed with the calculations to find the specific values of the numbers.

Performing the division

- Rewrite as:

$$x = \frac{0.038}{1.9}$$

- To simplify the division, multiply numerator and denominator by 10 to eliminate decimal:

$$x = \frac{0.038 \times 10}{1.9 \times 10} = \frac{0.38}{19}$$

- Now, divide 0.38 by 19:

$$x = \frac{0.38}{19}$$

Since 19 does not divide 0.38 evenly, perform the division:

- Recognize that $(19 \times 0.02 = 0.38)$.

Therefore:

$$x = 0.02$$

Finding the other number

- The second number is $(0.9x)$:

$$0.9 \times 0.02 = 0.018$$

Final Answer and Verification

Now that we've calculated both numbers, it's essential to verify the solution to ensure accuracy.

Values of the numbers

- First number: $x = 0.02$.
- Second number: $0.9x = 0.018$.

Check the sum

- Sum: $0.02 + 0.018 = 0.038$.

Since the sum matches the given total, the solution is correct.

Summary of the solution

- The first number is 0.02.
- The second number is 0.018.

Additional Insights and Related Problems

Understanding this problem opens the door to tackling a variety of similar algebraic problems involving relationships between numbers.

Common types of related problems include:

- Problems where one number is a multiple or fraction of another.
- Problems involving sums or differences of numbers.
- Word problems that translate into algebraic equations.

Strategies for solving such problems:

- Assign variables clearly.
- Translate relationships into algebraic expressions.
- Combine like terms and isolate variables.
- Verify solutions by substitution.

Practical Applications

Solving such problems is not only an academic exercise but also has real-world applications:

- Financial calculations where proportions of amounts are involved.
- Engineering problems involving ratios and sums.
- Statistics, where parts of data are related proportionally.
- Physics, where quantities are proportional to each other.

Understanding how to set up and solve algebraic equations in these contexts is essential for problem-solving across various fields.

Conclusion

The problem of finding two numbers where one is 0.9 times the other, and their sum is 0.038, demonstrates core algebraic principles:

- Translating word problems into equations.
- Combining like terms.
- Solving for variables through division.
- Verifying solutions.

The key steps involved understanding the relationship, setting up the correct algebraic expression, performing arithmetic calculations precisely, and confirming the results. Mastery of these techniques enhances one's ability to handle more complex problems involving ratios, proportions, and sums.

Final notes: Always double-check calculations and ensure that solutions make sense within the context of the problem. This practice not only confirms accuracy but also deepens understanding of algebraic concepts.

Summary of the findings:

- The first number is 0.02.
- The second number is 0.018.
- Their sum: 0.038, matching the problem statement.

By following a systematic approach, you can confidently solve similar problems involving relationships between numbers and their sums.

Frequently Asked Questions

How do you set up an equation to find two numbers where one is 0.9 times the other and their sum is 0.038?

Let the larger number be x . Then the smaller number is $0.9x$. Their sum is $x + 0.9x = 0.038$. Simplify to get $1.9x = 0.038$, then solve for x .

What is the value of the larger number if it is 0.9 times the other, and their sum is 0.038?

First, find x from $1.9x = 0.038$, so $x = 0.038 / 1.9 \approx 0.02$. The larger number is approximately 0.02.

How do you find the smaller number in this problem?

Since the smaller number is 0.9 times the larger, multiply the larger number by 0.9: $0.02 \cdot 0.9 = 0.018$. So, the smaller number is approximately 0.018.

Can you verify the solution by adding the two numbers?

Yes. Adding 0.02 and 0.018 gives 0.038, which matches the given sum, confirming the solution is correct.

What is the importance of setting the variable correctly in this type of problem?

Correctly setting the variable (e.g., letting x represent the larger number) simplifies the process of forming and solving the equations accurately.

Are there alternative methods to solve this problem besides setting up an algebraic equation?

While algebra is the most straightforward method, one could also use proportional reasoning or ratios, but setting up an equation is the most efficient for precise calculation.

What concept does this problem mainly test?

This problem mainly tests understanding of ratios, algebraic equations, and basic problem-solving skills involving variables and proportional relationships.

Additional Resources

WILL MARK BRAINLIEST One Number Is 0.9 Of Another Number. Their Sum Is 0.038. Find Each Number.

Mathematics problems often challenge our understanding of algebraic concepts and problem-solving

skills, and the problem "One number is 0.9 of another number. Their sum is 0.038. Find each number." exemplifies this perfectly. This problem not only tests basic algebraic manipulation but also emphasizes comprehension of proportional relationships and the ability to translate word problems into algebraic equations. As we analyze and solve this problem, it offers insight into the importance of methodical reasoning, the elegance of algebra, and the relevance of such exercises in developing mathematical literacy.

Understanding the Problem

Restating the Problem

The problem states:

- One number (let's call it x) is 0.9 of another number (call it y).
- The sum of these two numbers ($x + y$) is 0.038.

The goal is to find the values of x and y .

Key Details and Clarifications

- The phrase "One number is 0.9 of another number" indicates a proportional relationship, specifically that $x = 0.9 y$.
- The sum $x + y = 0.038$ provides an additional equation.
- The problem is straightforward but requires careful translation into algebraic equations for solution.

Breaking Down the Algebraic Approach

Defining Variables

To solve the problem, assign variables:

- Let x = the first number.
- Let y = the second number.

Given the relationship:

- $x = 0.9 y$.

And the sum:

- $x + y = 0.038$.

Formulating Equations

Based on the above:

1. $x = 0.9 y$ (relationship)
2. $x + y = 0.038$ (sum)

Substitute x from equation 1 into equation 2:

$$- 0.9 y + y = 0.038$$

Combine like terms:

- $(0.9 + 1) y = 0.038$
- $1.9 y = 0.038$

Now, solve for y :

$$- y = 0.038 / 1.9$$

Calculate y :

$$- y = 0.02$$

Once y is known, find x :

$$- x = 0.9 y = 0.9 \cdot 0.02 = 0.018$$

Result:

- $x = 0.018$
- $y = 0.02$

Verification and Validation

Checking the Calculations

To ensure the solution is correct, verify the sum:

$$- x + y = 0.018 + 0.02 = 0.038, \text{ which matches the given sum.}$$

Check the proportional relationship:

- Is $x = 0.9 y$?
- $0.9 \cdot 0.02 = 0.018$, which confirms the relationship.

Thus, the solutions satisfy both conditions, confirming their correctness.

Implications of the Solution

This problem demonstrates the effectiveness of substitution in solving systems of linear equations. It

also emphasizes the importance of understanding relationships and translating word problems into algebraic forms efficiently.

Features and Pros of This Problem

- Reinforces basic algebraic skills: substitution, solving linear equations.
- Illustrates proportional relationships: understanding "a is b of b" type statements.
- Encourages careful reading: ensuring all conditions are incorporated correctly.
- Applicable in real-life contexts: such as financial calculations, proportions, and ratios.

Potential Challenges and Common Mistakes

- Misinterpreting the proportional statement: confusing $x = 0.9y$ with other potential relationships.
- Arithmetic errors: especially in dividing decimals.
- Forgetting to verify solutions: essential to confirm that both conditions are satisfied.
- Overlooking units or decimal precision: critical for accuracy.

Alternative Approaches and Methods

While substitution is the most straightforward method here, other methods can be considered:

- Graphical method: plotting the equations to find the intersection point.
- Elimination method: less applicable here due to the single substitution, but useful in more complex systems.
- Using a calculator or algebra software: useful for quick computation, especially with more complex systems.

Application and Broader Context

Problems like these are foundational in mathematics education because they develop critical thinking and problem-solving skills. They are also directly applicable in various fields:

- Economics: analyzing ratios and proportions in financial models.
- Science: understanding relationships between variables.

- Engineering: designing systems with proportional parameters.

In competitive exams and standardized tests, such problems are common, testing students' ability to translate words into equations and solve efficiently.

Summary and Final Thoughts

This problem, "One number is 0.9 of another number. Their sum is 0.038," exemplifies classic algebraic problem-solving. By defining variables, translating relationships into equations, and solving systematically, we arrive at the solutions: $x = 0.018$ and $y = 0.02$. The process underscores the importance of careful reading, understanding relationships, and applying algebraic techniques.

The problem's simplicity makes it suitable for learners beginning their exploration of proportional relationships and systems of equations, while its structure provides a solid foundation for tackling more complex real-world problems. The key takeaway is that clarity in translating word problems into mathematical expressions is crucial, and with practice, such problems become more manageable and intuitive.

In conclusion, mastering problems like this enhances mathematical literacy and builds confidence in approaching diverse quantitative challenges. Whether in academics, professional contexts, or everyday decision-making, the skills developed here are universally valuable.

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