

If A Number Is Tripled, It Gives The Same Result As When 28 Is Added To It.find The Number

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Find The Number

Understanding how to translate word problems into algebraic expressions is fundamental in mathematics. The problem statement here provides a scenario involving a number, its tripled value, and an addition of 28, all leading to a simple yet insightful algebraic equation. In this article, we will explore the process of solving such problems comprehensively, discuss the underlying concepts, and provide step-by-step solutions. Whether you're a student brushing up on algebra or someone interested in problem-solving techniques, this guide will help clarify the process.

Breaking Down the Problem Statement

Before jumping into solving the problem, it's important to understand what the question is asking and what information it provides.

Understanding the Key Components

The problem states:

```
> "If A Number Is Tripled, It Gives The Same Result As When 28 Is Added To  
It. Find The Number."
```

From this, we identify two key components:

- The unknown number, which we will denote as x .
- The relationship between the tripled number and the number after adding 28.

Rephrasing the Problem

In simpler terms, the problem is asking us to find the value of x such that:

- When x is multiplied by 3, the result is equal to $x + 28$.

Expressed mathematically, the statement becomes:

```
>  $3x = x + 28$ 
```

This algebraic equation forms the basis of our solution process.

Formulating the Mathematical Equation

To solve such a problem, the key step is translating words into an algebraic equation accurately.

Step-by-Step Translation

1. Identify the unknown: The number we're trying to find, denoted as x .
2. Express the tripled value: Tripling x gives $3x$.
3. Express the addition: Adding 28 to x results in $x + 28$.
4. Set the two expressions equal: The problem states these two are the same, leading to:

```
```plaintext
3x = x + 28
```
```

This equation encapsulates the problem's conditions.

Solving the Equation: Step-by-Step Guide

Now that we've formulated the equation, the next step is to solve for x . Let's go through the process carefully.

Step 1: Bring similar terms together

Subtract x from both sides to isolate the variable:

```
```plaintext
3x - x = 28
```
```

Simplify:

```
```plaintext
2x = 28
```
```

Step 2: Solve for x

Divide both sides of the equation by 2:

```
```plaintext
x = 28 / 2
```
```

Calculate:

```
```plaintext
x = 14
```
```

Therefore, the number is 14.

Summary of the solution:

- The unknown number x is 14.
- When tripled, $3 \times 14 = 42$.
- When 28 is added to x , $14 + 28 = 42$.
- Both expressions give the same result, confirming the solution.

Verification of the Solution

Verifying the answer is an essential part of problem-solving, ensuring no mistakes were made.

Verification Steps

- Calculate tripled value: $3 \times 14 = 42$
- Calculate addition result: $14 + 28 = 42$
- Compare: Both results are equal (42), confirming $x = 14$ is correct.

Additional Examples and Practice Problems

Understanding the core concept is critical, but practicing similar problems can solidify your grasp.

Example 1:

Problem:

If twice a number minus 5 equals 15, find the number.

Solution:

- Let the number be x .
- Write the equation: $2x - 5 = 15$.
- Add 5 to both sides: $2x = 20$.
- Divide both sides by 2: $x = 10$.
- Answer: The number is 10.

Example 2:

Problem:

A number increased by 3 is equal to 20. Find the number.

Solution:

- Let the number be x .
- Equation: $x + 3 = 20$.
- Subtract 3 from both sides: $x = 17$.
- Answer: The number is 17.

Practice Problems for You:

1. The sum of a number and 12 is equal to 30. Find the number.
2. Tripling a number results in 45. Find the number.
3. When 7 is subtracted from a number, the result is 13. Find the number.
4. A number decreased by 9 gives 27. Find the number.

Applying the Concept to Real-Life Situations

Word problems like this are common in everyday life. Here's how understanding the problem helps in real-world scenarios.

Example 1: Budgeting

Suppose you have a certain amount of money, and if you triple your savings, it equals the amount you would have after adding 28 to your current savings. Finding your initial savings involves solving an equation similar to the problem discussed.

Example 2: Distance and Speed

If a car's trip distance is tripled, and the total matches the distance after adding 28 kilometers, you can set up an equation to find the original distance.

Key Takeaways and Tips for Solving Similar Problems

- Always carefully read the problem and identify the unknowns.
- Convert the word problem into an algebraic equation step-by-step.
- Simplify the equation systematically.

- Verify your solution by substituting back into the original statement.
- Practice similar problems to improve your algebraic reasoning skills.

Conclusion

The problem "If A Number Is Tripled, It Gives The Same Result As When 28 Is Added To It. Find The Number" demonstrates a straightforward application of algebraic principles. By translating words into an equation, simplifying, and solving, you can find the unknown number efficiently. The key lies in understanding the relationship expressed and accurately representing it mathematically. Regular practice with similar problems enhances problem-solving skills and builds confidence in algebraic reasoning. Remember, every complex-looking problem can often be broken down into simple steps, leading to clear and accurate solutions.

Frequently Asked Questions

What is the mathematical equation representing the problem where a number is tripled and equals 28 more than itself?

The equation is $3x = x + 28$.

How do you solve for the number in the equation $3x = x + 28$?

Subtract x from both sides to get $2x = 28$, then divide both sides by 2 to find $x = 14$.

What is the solution to the equation where tripling a number equals adding 28 to it?

The solution is the number 14.

Why does subtracting x from both sides help solve the equation $3x = x + 28$?

It isolates the variable x , simplifying the equation to find its value.

Can this type of problem be solved using algebraic methods? How?

Yes, by setting up an equation and isolating the variable using addition, subtraction, multiplication, or division.

What real-world scenarios could this type of problem apply to?

It can apply to situations like calculating investment growth, recipe adjustments, or any scenario involving proportional increases and additive changes.

What is the importance of verifying the solution in such algebraic problems?

Verifying ensures that the solution satisfies the original problem, confirming its correctness.

How can understanding this problem help in solving more complex algebraic equations?

It builds foundational skills in setting up equations, manipulating algebraic expressions, and understanding the relationships between variables.

Additional Resources

If A Number Is Tripled, It Gives The Same Result As When 28 Is Added To It. Find The Number.

Understanding basic algebraic concepts can sometimes feel daunting, but with clear reasoning and step-by-step problem-solving, even complex-sounding statements become approachable. One such intriguing problem involves finding an unknown number based on a simple relationship: when the number is tripled, the result equals the number plus 28. This problem not only provides insight into algebraic expressions but also highlights the importance of translating words into mathematical equations, a skill fundamental to many areas of STEM education and real-world problem-solving.

In this article, we will dissect this problem thoroughly, exploring the underlying principles, the step-by-step approach to solving it, and the broader applications of similar algebraic reasoning. Whether you're a student brushing up on your algebra skills or a curious reader interested in mathematical logic, this exploration aims to clarify the process in a clear, reader-friendly manner.

Understanding the Problem in Context

Before jumping into the calculations, it's essential to grasp what the problem is asking. The statement:

If a number is tripled, it gives the same result as when 28 is added to it.

This sentence contains two key components:

1. Tripling a number: Multiplying the unknown number by 3.
2. Adding 28 to the number: Increasing the same number by 28.

The phrase "gives the same result" indicates an equality between these two

expressions. So, the problem is asking: What is the value of this unknown number?

In essence, it's a straightforward algebraic problem: find the number x such that:

$$3x = x + 28$$

Translating the Word Problem Into an Equation

The first critical step in solving any word problem is translating the words into a mathematical equation. Here's how to do it systematically:

- Identify the unknown: Let the number be x .
- Express the operations described:
 - Tripling the number: $3x$
 - Adding 28 to the number: $x + 28$
- Set them equal: Since they produce the same result,

$$3x = x + 28$$

This algebraic equation is the core of the problem. Solving it will give us the value of x .

Step-by-Step Solution of the Equation

The next step involves applying algebraic principles to solve the equation $3x = x + 28$. Let's break it down:

Step 1: Isolate the variable x

Subtract x from both sides to gather all x terms on one side:

$$3x - x = 28$$

which simplifies to:

$$2x = 28$$

Step 2: Solve for x

Divide both sides by 2 to find x :

$$x = \frac{28}{2}$$

$$x = 14$$

Result:

The unknown number is 14.

Verifying the Solution

It's always good practice to verify the answer by substituting it back into the original statement:

- Tripling the number: $(3 \times 14 = 42)$
- Adding 28 to the number: $(14 + 28 = 42)$

Since both expressions equal 42, the solution is correct. The number 14 satisfies the condition that tripling it yields the same result as adding 28.

Broader Context and Applications

While this problem is straightforward, its structure is foundational in algebra and appears frequently in various contexts. Understanding how to set up and solve such equations is crucial not only in academic settings but also in practical situations such as finance, engineering, and computer science.

Key Takeaways:

- Translating words into mathematical expressions is a fundamental skill. Practice involves identifying keywords like "tripled," "added," "more than," "less than," which map to multiplication, addition, subtraction, etc.
- Formulating equations based on relative statements is vital. Recognizing relationships and expressing them mathematically simplifies problem-solving.
- Solving linear equations involves isolating the variable, typically through inverse operations such as addition/subtraction and multiplication/division.

Extending the Concept: Variations of the Problem

Once comfortable with the basic problem, students and learners can explore variations to deepen their understanding:

- Change the constants: For example, what if the statement was "If a number is doubled, it equals 50 more than the number"? Formulate and solve the corresponding equation.
- Incorporate more operations: Introduce multiplication and division, such as "If twice a number minus 5 equals 15," then find the number.
- Apply to real-world scenarios: For example, if a store offers a discount such that the price after tripling the original price equals the price plus 28 dollars, what was the original price?

These variations encourage flexible thinking and reinforce algebraic skills.

Common Mistakes to Avoid

When tackling algebraic problems, especially beginner-level ones, certain pitfalls are common:

- Misinterpreting the word problem: Always ensure you understand what each part of the statement indicates before translating it into an equation.
- Incorrectly setting up the equation: Remember the core relationships—if one expression equals another, set them equal.

- Forgetting to verify solutions: Always substitute your answer back into the original problem to confirm correctness.
- Overcomplicating simple problems: This problem is straightforward, but some students might overthink or introduce unnecessary steps.

Being mindful of these points ensures accurate and efficient problem-solving.

Final Remarks

The problem "If a number is tripled, it gives the same result as when 28 is added to it," succinctly encapsulates the essence of algebra—translating words into equations and solving for unknowns. The solution, 14, underscores the power of simple algebraic manipulations to solve real problems.

Mastering such problems builds a foundation for more complex mathematical concepts and enhances logical reasoning. Whether you're solving for unknown quantities in academics or analyzing data in the workplace, the ability to formulate and solve equations remains a vital skill.

In summary, by understanding the problem, translating it into an equation, methodically solving for the unknown, and verifying the answer, learners develop confidence in their algebra skills. As you encounter similar problems, remember the steps outlined here: interpret, formulate, solve, and verify. With practice, these steps become second nature, opening the door to a world of mathematical exploration and problem-solving excellence.

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