

The Difference Of 3 Times A Number And 2 Times That Same Number Is 80.what Is The Number

The Difference Of 3 Times A Number And 2 Times That Same Number Is 80. What Is The Number?

Understanding basic algebraic concepts is essential for solving everyday mathematical problems. One such problem involves finding an unknown number based on a relationship involving multiples of that number. In this article, we explore the problem: "The difference of 3 times a number and 2 times that same number is 80. What is the number?" We will break down the problem step-by-step, explain how to set up an algebraic equation, solve it, and understand its application in real-world scenarios.

Understanding the Problem

Before diving into the solution, it's important to carefully interpret the problem statement. The key parts of the problem are:

- "3 times a number" indicates multiplying an unknown number by 3.
- "2 times that same number" indicates multiplying the same unknown number by 2.
- The "difference" of these two quantities is 80, meaning one quantity minus the other equals 80.

What Is Being Asked?

The problem asks us to find the value of the unknown number based on the relationship described. Essentially, this involves setting up an algebraic equation representing the situation and then solving for the unknown.

Setting Up the Algebraic Equation

To find the unknown number, often represented as x , follow these steps:

Step 1: Define the Variable

- Let x = the unknown number.

Step 2: Express the Given Quantities

- 3 times the number: $3x$
- 2 times the number: $2x$

Step 3: Write the Relationship as an Equation

- The difference between these two quantities is 80:

$$(3x) - (2x) = 80$$

Step 4: Simplify the Equation

- Combine like terms:

$$3x - 2x = 80$$

$$x = 80$$

This straightforward equation reveals that the unknown number x is 80.

Solving the Equation Step-by-Step

Though the equation is simple, understanding each step is vital for solving more complex problems.

Step 1: Write the Equation

- As derived: $3x - 2x = 80$

Step 2: Combine Like Terms

$$-(3x - 2x) = x$$

Step 3: Isolate the Variable

- The simplified equation is $x = 80$

Step 4: Verify the Solution

- Substitute $x = 80$ back into the original expressions:
- 3 times the number: $3 \times 80 = 240$
- 2 times the number: $2 \times 80 = 160$
- Check the difference:
- $240 - 160 = 80$, which confirms our solution.

Real-World Applications of Similar Problems

Understanding how to formulate and solve such algebraic problems extends beyond pure mathematics. It has practical applications in various fields:

Financial Planning

- Calculating differences in investments or expenses based on multiple factors.

Business and Economics

- Comparing revenues, costs, or profits that involve proportional relationships.

Engineering and Science

- Determining quantities where relationships are linear, such as forces, distances, or energy.

Additional Examples of Similar Problems

Practicing with related problems can solidify understanding:

1. Find a number if 5 times the number minus 3 times the same number equals 20.
2. If twice a number plus 4 equals 18, what is the number?
3. The sum of 7 times a number and 3 times the same number is 50. Find the number.

Each of these can be approached with similar algebraic techniques: define a variable, write an equation, simplify, and solve.

Tips for Solving Algebraic Word Problems

To efficiently solve problems like "The difference of 3 times a number and 2 times that same number is 80," keep these tips in mind:

- **Read Carefully:** Understand what the problem is asking before setting up equations.
- **Define Variables Clearly:** Assign a letter to the unknown quantity.

- **Translate Words into Math:** Convert relationships into algebraic expressions.
- **Check Your Work:** Substitute your solution back into the original expressions to verify accuracy.
- **Practice Regularly:** The more problems you solve, the more intuitive these steps become.

Conclusion

The problem "The difference of 3 times a number and 2 times that same number is 80" is a classic example of how algebra simplifies real-world problems. By translating words into algebraic equations, solving for the unknown becomes straightforward. The solution, $x = 80$, demonstrates that the number in question is 80.

Mastering such problems enhances critical thinking and problem-solving skills, which are invaluable in academic, professional, and everyday contexts. Whether you're dealing with finances, engineering, or simple puzzles, understanding how to set up and solve algebraic equations is a fundamental skill. Practice with similar problems will strengthen your confidence and proficiency in algebra.

Remember, the key steps are understanding the problem, translating it into an equation, solving it systematically, and verifying your answer. With these techniques, you can confidently tackle a wide range of mathematical challenges involving unknown quantities and their relationships.

Frequently Asked Questions

What is the algebraic equation for the problem 'The difference of 3 times a number and 2 times that same number is 80'?

The equation is $3x - 2x = 80$.

How do you simplify the equation $3x - 2x = 80$?

Simplify by combining like terms: $(3x - 2x) = x$, so the simplified equation is $x = 80$.

What is the value of the number in the problem?

The value of the number is 80.

Can this problem be solved without algebra? Why or why not?

It's difficult to solve without algebra because you need to set up an equation to find the unknown number, which algebra provides a straightforward method for.

What does the phrase 'three times a number' mean in algebra?

It means 3 multiplied by the unknown number, written as $3x$.

What does 'two times that same number' signify in the problem?

It signifies 2 multiplied by the same unknown number, written as $2x$.

Why is the answer to the problem 80?

Because solving the equation $3x - 2x = 80$ simplifies to $x = 80$, which is the value of the number.

How can you verify the solution to this problem?

Substitute $x = 80$ into the original expressions: $3 \times 80 = 240$ and $2 \times 80 = 160$; then, $240 - 160 = 80$, confirming the solution is correct.

Is the problem asking for the value of the number directly or for an expression?

It is asking for the value of the number itself.

What is the key step in solving this type of algebraic problem?

The key step is setting up a correct equation based on the word problem and then simplifying and solving for the unknown.

Additional Resources

The Difference Of 3 Times A Number And 2 Times That Same Number Is 80. What Is The Number?

Understanding basic algebra concepts is essential for solving many everyday problems and developing logical thinking skills. One such problem involves a simple yet intriguing equation: "The difference of 3 times a number and 2 times that same number is 80. What is the number?" While it appears straightforward, unraveling the solution offers valuable insights into algebraic reasoning. In this article, we will explore this problem step-by-step, demystify the underlying mathematics, and provide a comprehensive guide to arrive at the answer.

The Significance of Algebra in Problem Solving

Before delving into the specifics of the problem, it's important to appreciate why algebra plays a vital role in problem-solving:

- Universal Language of Mathematics: Algebra provides a symbolic framework to express

relationships between quantities, making it easier to analyze complex problems.

- Application in Real Life: From budgeting and shopping to engineering and technology, algebraic reasoning helps in decision-making.

- Foundation for Advanced Mathematics: Mastery of algebra is essential for higher-level studies in calculus, physics, computer science, and beyond.

Understanding how to translate words into mathematical expressions is a fundamental skill, and the problem at hand is a perfect example of this.

Breaking Down the Problem

Let's carefully examine the problem statement:

"The difference of 3 times a number and 2 times that same number is 80. What is the number?"

At face value, this involves a simple algebraic expression, but to solve it effectively, we need to parse the language carefully.

Key Components:

- "3 times a number": This suggests multiplying an unknown number by 3.
- "2 times that same number": Similarly, this indicates multiplying the same unknown number by 2.
- "Difference": This indicates subtraction between the two quantities.
- "Is 80": The result of the subtraction equals 80.

By translating this into an algebraic equation, we can systematically solve for the unknown number.

Defining the Unknown Variable

The first step in any algebraic problem is to assign a variable to the unknown:

- Let x represent the number we are trying to find.

Using this notation, the expressions become:

- 3 times the number: $3x$
- 2 times the number: $2x$

Constructing the Equation

Based on the problem statement, the phrase "The difference of 3 times a number and 2 times that same number is 80" can be expressed mathematically as:

$$(3x) - (2x) = 80$$

This equation encapsulates the entire problem in a concise, solvable form.

Solving the Equation

Now, we proceed with solving for x step-by-step.

Step 1: Simplify the Equation

Subtract the like terms:

$$\begin{aligned}(3x) - (2x) &= 80 \\ \Rightarrow 3x - 2x &= 80 \\ \Rightarrow (3x - 2x) &= 80\end{aligned}$$

Since $3x - 2x$ simplifies to x :

$$x = 80$$

Step 2: Interpret the Result

The solution indicates that $x = 80$.

This means that the number we are seeking is 80.

Verifying the Solution

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

- 3 times the number: $3 \cdot 80 = 240$
- 2 times the number: $2 \cdot 80 = 160$

Calculate the difference:

$$240 - 160 = 80$$

Since the difference matches the given value, the solution $x = 80$ is correct.

Broader Context and Applications

While this problem is straightforward, similar algebraic problems are common in various contexts:

- Financial calculations: Determining the original amount based on differences and multipliers.
- Physics: Calculating unknown quantities like distances, speeds, or forces.
- Engineering: Designing systems where relationships between variables are expressed mathematically.

Mastering the process of translating words into equations and solving them enhances logical

reasoning and problem-solving skills applicable across numerous fields.

Common Mistakes and How to Avoid Them

When solving algebraic word problems, certain pitfalls can lead to errors. Here are some common mistakes related to this type of problem:

1. Misinterpreting the Language: Confusing "difference" with "sum" or "product" can lead to incorrect equations. Always parse the words carefully.
2. Incorrect Variable Assignment: Assigning a variable that doesn't match the problem context can cause confusion.
3. Forgetting to Simplify: Not combining like terms before solving prolongs the process and increases chances of error.
4. Ignoring the Verification Step: Failing to check the solution against the original problem can result in accepting incorrect answers.

To avoid these pitfalls:

- Read the problem carefully multiple times.
- Break down complex sentences into smaller parts.
- Write out the algebraic expressions explicitly.
- Always substitute the found value back into the original problem.

Extending the Problem: Variations and Practice

Practicing variations of the original problem can deepen understanding. Here are some examples:

- If the difference of 4 times a number and 3 times that same number is 50, what is the number?

Equation: $(4x) - (3x) = 50 \rightarrow x = 50$

- If the difference of twice a number and thrice the same number is -20, what is the number?

Equation: $(2x) - (3x) = -20 \rightarrow -x = -20 \rightarrow x = 20$

By solving these, students can reinforce their skills in translating words into equations and solving them efficiently.

Conclusion: The Power of Algebra in Everyday Problem Solving

The initial problem, "The difference of 3 times a number and 2 times that same number is 80," exemplifies the core principles of algebraic reasoning: translating words into equations, simplifying, solving, and verifying. The solution—80—demonstrates how a clear understanding of basic algebra can unlock answers to seemingly complex problems.

In a broader perspective, developing proficiency in algebra not only enhances academic success but also equips individuals with critical thinking skills essential for navigating real-world challenges. Whether managing personal finances, interpreting data, or solving engineering problems, the ability to set up and solve algebraic equations remains a fundamental skill.

By mastering these techniques, learners can confidently approach a wide array of problems, transforming vague descriptions into precise solutions. So, the next time you encounter a word problem involving unknown quantities, remember the process: understand the language, define your variables, construct the equation, solve systematically, and verify your answer. This approach will serve you well across countless scenarios, empowering you to find solutions efficiently and accurately.

The Difference Of 3 Times A Number And 2 Times That Same Number Is 80 What Is The Number

The Difference Of 3 Times A Number And 2 Times That Same Number Is 80 What Is The Number

Related Articles

- [What Are The Reasons For Picking PepsiCo As A Companyfor Analysis In Managerial Accounting](#)
- [Passage Of The Pendleton Act Was Encouraged By The Assassination Of James Garfield. T/F?](#)
- [Ecological Economics Is Different From The Other Economic Theories Because It Recognizes The](#)

[Back to Home](#)