

what is the solution to $3/2b+5 = 17$

what is the solution to $3/2b+5 = 17$ is a common algebraic problem that requires understanding of basic algebraic principles and equation solving methods. This article explores the step-by-step approach to solving the equation involving the expression $3/2b+5$ equal to 17, clarifying the operations needed and the underlying mathematical concepts. By focusing on the solution to $3/2b+5 = 17$, readers will gain insight into how to isolate variables, perform arithmetic operations correctly, and validate their answers. Additionally, the article covers common pitfalls, related algebraic expressions, and tips for efficient problem-solving. Whether for students or individuals refreshing their algebra skills, this guide aims to provide a comprehensive explanation. The following sections will delve into understanding the equation, solving techniques, and applying the solution in practical contexts.

- Understanding the Equation $3/2b+5 = 17$
- Step-by-Step Solution Process
- Common Mistakes and How to Avoid Them
- Applications of the Equation in Real-Life Scenarios
- Additional Tips for Solving Similar Algebraic Problems

Understanding the Equation $3/2b+5 = 17$

Before attempting to solve the equation $3/2b+5 = 17$, it is essential to understand the components and structure of the equation. The expression involves a variable 'b', a fractional coefficient $3/2$, a constant term 5, and an equality to the number 17. This type of equation is linear, meaning it involves variables raised only to the first power, making it straightforward to solve using algebraic manipulation. Recognizing that the equation represents a relationship where the expression on the left must equal the value 17 is crucial for correctly isolating the variable 'b'.

Breaking Down the Expression

In the equation $3/2b+5 = 17$, the term $3/2b$ can be interpreted as $(3/2)$ multiplied by b. The addition of 5 is a constant term added to the product. Understanding the order of operations is important here: multiplication must be performed before addition. This means that first, $3/2$ is multiplied by b, and then 5 is added to the result. This clarity helps in correctly setting up the steps to isolate the variable and solve the equation.

Clarifying the Notation

Sometimes, equations like $3/2b+5 = 17$ can cause confusion due to ambiguous notation. It is important to note that $3/2b$ means $(3/2)$ times b , not 3 divided by $(2b)$. Correct interpretation avoids errors in solving. If the equation were written as $3/(2b) + 5 = 17$, the approach to solving would differ. Therefore, confirming the intended meaning is a critical first step in addressing the problem.

Step-by-Step Solution Process

Solving what is the solution to $3/2b+5 = 17$ involves a systematic approach to isolate the variable 'b' on one side of the equation. This section details each step required to find the value of 'b' that satisfies the equation, ensuring clarity and accuracy throughout the process.

Step 1: Subtract 5 from Both Sides

The first step is to eliminate the constant term on the left side to isolate the term containing the variable. Subtracting 5 from both sides of the equation balances it and simplifies the expression:

- Original equation: $(3/2)b + 5 = 17$
- Subtract 5 from both sides: $(3/2)b + 5 - 5 = 17 - 5$
- Simplified to: $(3/2)b = 12$

Step 2: Multiply Both Sides by the Reciprocal of 3/2

To isolate 'b', multiply both sides by the reciprocal of the coefficient $3/2$, which is $2/3$. This cancels out the fraction on the left side:

- Multiply both sides: $(2/3) \times (3/2)b = 12 \times (2/3)$
- Simplifies to: $b = 12 \times (2/3)$
- Calculate the right side: $b = 12 \times 2 / 3 = 24 / 3 = 8$

Step 3: Verify the Solution

Substituting $b = 8$ back into the original equation confirms the solution's

accuracy:

- Calculate left side: $(3/2) \times 8 + 5 = (3 \times 8) / 2 + 5 = 24 / 2 + 5 = 12 + 5 = 17$
- Left side equals right side (17), confirming $b = 8$ is correct.

Common Mistakes and How to Avoid Them

When solving equations similar to what is the solution to $3/2b+5 = 17$, certain errors frequently occur. Awareness of these mistakes helps in avoiding them and ensures accurate problem-solving.

Misinterpreting the Fractional Coefficient

One common error is misunderstanding the coefficient $3/2b$ as 3 divided by $(2b)$ instead of $(3/2)$ times b . This misinterpretation leads to incorrect algebraic operations and wrong answers. Always clarify the expression and rewrite it if necessary for better understanding.

Incorrect Order of Operations

Failing to follow the proper order of operations, particularly performing addition before multiplication, can result in mistakes. In the equation, multiplication of $3/2$ and b must precede adding 5. Using parentheses to group terms can help maintain clarity.

Forgetting to Perform Operations on Both Sides

When manipulating equations, it is crucial to perform the same operation on both sides to keep the equation balanced. Omitting this step leads to invalid results.

Applications of the Equation in Real-Life Scenarios

The equation represented by what is the solution to $3/2b+5 = 17$ is not only a classroom exercise but also has practical applications. Understanding how to solve such equations can be beneficial in various fields.

Financial Calculations

Linear equations with fractional coefficients often appear in financial contexts, such as calculating interest, loan payments, or budgeting where proportional relationships exist.

Engineering and Physics Problems

In engineering and physics, equations of this nature are used to determine variables related to rates, forces, or measurements where relationships between quantities are linear.

Everyday Problem Solving

Even in daily life, solving linear equations helps in tasks like adjusting recipes, splitting bills proportionally, or converting units based on given ratios.

Additional Tips for Solving Similar Algebraic Problems

Mastering what is the solution to $\frac{3}{2}b + 5 = 17$ provides a foundation for tackling a wide range of algebraic equations. The following tips aid in efficient and accurate problem-solving.

1. **Rewrite Equations Clearly:** Use parentheses to remove ambiguity and clearly define terms.
2. **Isolate Variables Early:** Focus on isolating the variable step-by-step to avoid complexity.
3. **Check Each Step:** Review calculations and operations to prevent simple errors.
4. **Use Reciprocal Multiplication:** When dealing with fractional coefficients, multiply by the reciprocal to simplify.
5. **Practice Regularly:** Consistent practice builds confidence and proficiency in solving linear equations.

Frequently Asked Questions

What is the solution to the equation $\frac{3}{2}b + 5 = 17$?

To solve $\frac{3}{2}b + 5 = 17$, first subtract 5 from both sides: $\frac{3}{2}b = 12$. Then multiply both sides by $\frac{2}{3}$ to isolate b : $b = 12 * (\frac{2}{3}) = 8$.

How do you isolate the variable b in $\frac{3}{2}b + 5 = 17$?

Subtract 5 from both sides to get $\frac{3}{2}b = 12$, then multiply both sides by $\frac{2}{3}$ to isolate b : $b = 8$.

What steps are involved in solving $\frac{3}{2}b + 5 = 17$?

Step 1: Subtract 5 from both sides to get $\frac{3}{2}b = 12$. Step 2: Multiply both sides by $\frac{2}{3}$ to solve for b , resulting in $b = 8$.

Is the solution to $\frac{3}{2}b + 5 = 17$ positive or negative?

The solution is positive; $b = 8$.

Can you solve for b if $\frac{3}{2}b + 5 = 17$?

Yes. Subtract 5 from both sides to get $\frac{3}{2}b = 12$, then multiply both sides by $\frac{2}{3}$: $b = 8$.

What does b equal in the equation $\frac{3}{2}b + 5 = 17$?

b equals 8.

How do you check the solution for $\frac{3}{2}b + 5 = 17$ after finding b ?

Substitute $b = 8$ back into the equation: $(\frac{3}{2})*8 + 5 = 12 + 5 = 17$, which is true.

What is the value of b when $\frac{3}{2}b + 5$ equals 17?

The value of b is 8.

Is $\frac{3}{2}b + 5 = 17$ a linear equation?

Yes, it is a linear equation in terms of b .

What is the first step to solve $\frac{3}{2}b + 5 = 17$?

The first step is to subtract 5 from both sides of the equation.

Additional Resources

1. *Algebra Essentials: Mastering Linear Equations*

This book focuses on the fundamentals of algebra, including solving linear equations like $\frac{3}{2}b + 5 = 17$. It breaks down the steps to isolate variables and understand how to manipulate equations effectively. Perfect for beginners and those needing a refresher on algebraic principles.

2. *Step-by-Step Guide to Solving Linear Equations*

Designed to guide readers through the process of solving equations involving fractions and variables, this book simplifies concepts such as $\frac{3}{2}b + 5 = 17$. It provides clear examples and practice problems to help build confidence in algebraic problem-solving.

3. *Algebra I Workbook: Practice and Solutions*

This workbook offers numerous practice problems on linear equations, including those with fractional coefficients like $\frac{3}{2}b + 5 = 17$. Each section includes detailed solutions and explanations to reinforce understanding and improve skills.

4. *Understanding Fractions in Algebra*

Focusing on the role of fractions within algebraic equations, this book explains how to handle expressions like $\frac{3}{2}b + 5 = 17$. It covers methods for simplifying and solving equations with fractional terms, making complex problems more approachable.

5. *Pre-Algebra and Algebra Made Easy*

A comprehensive guide for students transitioning from basic arithmetic to algebra, this book covers linear equations and fractions thoroughly. It uses practical examples such as $\frac{3}{2}b + 5 = 17$ to demonstrate problem-solving techniques.

6. *Solving Equations: From Basics to Advanced*

This text explores a wide range of equations, starting with simple linear forms and progressing to more complex problems involving fractions and multiple steps. Readers learn how to systematically approach and solve problems like $\frac{3}{2}b + 5 = 17$.

7. *The Complete Algebra Handbook*

An all-in-one reference that covers key algebra topics including linear equations with fractional coefficients. It provides explanations, examples, and practice problems tailored to equations such as $\frac{3}{2}b + 5 = 17$, making it a valuable resource for students.

8. *Algebra for Beginners: Solving for Variables*

This beginner-friendly book introduces the concept of variables and how to

solve equations involving them. It offers clear instructions and examples, including problems like $3/2b + 5 = 17$, to help learners build foundational algebra skills.

9. *Math Made Simple: Linear Equations and Fractions*

Focusing on simplifying math concepts, this book helps readers understand and solve linear equations that include fractions. Through step-by-step guidance and practice exercises, it makes equations like $3/2b + 5 = 17$ easy to solve and comprehend.

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