

3/2-5/6-2/9 Answer Please

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When it comes to understanding mathematical expressions, especially fractions and their operations, clarity and precision are essential. The expression " $3/2-5/6-2/9$ " might seem straightforward at first glance, but it involves multiple steps that require careful attention to detail. Whether you're a student preparing for exams, a teacher designing lesson plans, or someone interested in enhancing your math skills, understanding how to evaluate such an expression is fundamental. In this comprehensive guide, we'll explore the step-by-step process to solve this expression, discuss the importance of common denominators, and review best practices for handling similar problems.

Understanding the Expression: $3/2 - 5/6 - 2/9$

Before diving into the solution, it's crucial to interpret the expression correctly.

Breaking Down the Components

- The expression consists of three fractions: $3/2$, $-5/6$, and $-2/9$.
- The operators are subtraction signs, indicating that we need to find a common denominator to combine these fractions efficiently.

Why Simplify Fractions?

Simplifying or combining fractions requires a common denominator so that the numerators can be directly compared or combined.

Step-by-Step Solution Process

To evaluate $3/2 - 5/6 - 2/9$, follow these systematic steps:

Step 1: Find the Least Common Denominator (LCD)

- The denominators are 2, 6, and 9.
- Prime factorization:
 - $2 = 2$
 - $6 = 2 \times 3$
 - $9 = 3 \times 3$

- To find the LCD:
- Take the highest powers of prime factors:
- 2 (from 2 and 6)
- 3^2 (from 9)
- $\text{LCD} = 2 \times 3^2 = 2 \times 9 = 18$

Step 2: Convert all fractions to have the LCD as the denominator

- Convert each fraction:
- $3/2$:
- Multiply numerator and denominator by 9:
- $3 \times 9 / 2 \times 9 = 27/18$
- $-5/6$:
- Multiply numerator and denominator by 3:
- $-5 \times 3 / 6 \times 3 = -15/18$
- $-2/9$:
- Multiply numerator and denominator by 2:
- $-2 \times 2 / 9 \times 2 = -4/18$

Step 3: Combine the fractions

- Write the combined numerator:
- 27 (from $3/2$)
- -15 (from $-5/6$)
- -4 (from $-2/9$)
- Sum these:
- $27 - 15 - 4 = 8$

Step 4: Write the result as a simplified fraction

- The combined fraction:
- $8/18$
- Simplify by dividing numerator and denominator by their greatest common divisor (GCD):
- GCD of 8 and 18 is 2
- Divide numerator and denominator by 2:
- $8 \div 2 = 4$
- $18 \div 2 = 9$
- Final simplified fraction:
- $4/9$

Final Answer: $4/9$

Additional Insights and Best Practices

Understanding how to work with fractions is foundational in mathematics. Here are some tips and insights to improve your skills further:

Importance of Finding the Least Common Denominator

- Simplifies the process of adding or subtracting fractions.
- Ensures accurate results without unnecessary complexity.
- Reduces the fraction to its simplest form efficiently.

Common Mistakes to Avoid

- Forgetting to adjust numerators when converting to common denominators.
- Overlooking the need to simplify the final answer.
- Miscalculating the LCD, especially with larger denominators.
- Confusing the signs (+/-) when combining fractions.

Practice Problems for Mastery

To strengthen your understanding, try solving these similar expressions:

1. $\frac{2}{3} + \frac{4}{9} - \frac{1}{6}$
2. $\frac{7}{8} - \frac{3}{4} + \frac{5}{16}$
3. $\frac{5}{12} - \frac{1}{3} + \frac{2}{5}$

Remember to follow the same steps: find the LCD, convert fractions, combine numerators, and simplify.

Applications of Fraction Operations

Fractions are not just mathematical exercises; they have real-world applications across various fields:

- Cooking and Recipes: Adjusting ingredient quantities.
- Construction: Precise measurements for materials.
- Finance: Calculating interest rates and proportions.
- Science: Data analysis involving ratios and proportions.

Understanding how to manipulate fractions efficiently enhances problem-solving skills across these disciplines.

Conclusion

In summary, evaluating the expression $\frac{3}{2} - \frac{5}{6} - \frac{2}{9}$ involves recognizing the need for a common denominator, converting each fraction appropriately, combining the numerators, and simplifying the result. The final answer, $\frac{4}{9}$, showcases the importance of systematic approaches in mathematics. By practicing these steps and avoiding common pitfalls, you can confidently handle similar fraction problems with ease. Whether for academic purposes or everyday calculations, mastering fraction operations is an invaluable skill that underpins many mathematical concepts and practical applications.

Frequently Asked Questions

What is the result of the expression $\frac{3}{2} - \frac{5}{6} - \frac{2}{9}$?

The result of the expression $\frac{3}{2} - \frac{5}{6} - \frac{2}{9}$ is $\frac{17}{18}$.

How do I simplify the expression $\frac{3}{2} - \frac{5}{6} - \frac{2}{9}$?

To simplify $\frac{3}{2} - \frac{5}{6} - \frac{2}{9}$, find a common denominator (18), convert each fraction, then perform the subtraction to get $\frac{17}{18}$.

What is the common denominator for $\frac{3}{2}$, $\frac{5}{6}$, and $\frac{2}{9}$?

The common denominator for $\frac{3}{2}$, $\frac{5}{6}$, and $\frac{2}{9}$ is 18.

Can you show step-by-step how to solve $\frac{3}{2} - \frac{5}{6} - \frac{2}{9}$?

Yes. Convert each fraction to denominator 18: $\frac{3}{2} = \frac{27}{18}$, $\frac{5}{6} = \frac{15}{18}$, $\frac{2}{9} = \frac{4}{18}$. Then perform: $\frac{27}{18} - \frac{15}{18} - \frac{4}{18} = \frac{(27 - 15 - 4)}{18} = \frac{8}{18}$, which simplifies to $\frac{4}{9}$. (Note: The previous answer was $\frac{17}{18}$, so rechecking shows the correct answer is $\frac{4}{9}$.)

Is the answer to $\frac{3}{2} - \frac{5}{6} - \frac{2}{9}$ equal to $\frac{17}{18}$ or $\frac{4}{9}$?

The correct simplified answer is $\frac{4}{9}$. The initial calculation of $\frac{17}{18}$ was incorrect.

What is the importance of finding a common denominator in fractions?

Finding a common denominator allows you to perform addition or subtraction of fractions accurately by aligning their denominators.

Can the expression $\frac{3}{2} - \frac{5}{6} - \frac{2}{9}$ be expressed as a decimal?

Yes. $\frac{4}{9}$ as a decimal is approximately 0.4444.

What are practical applications of solving such fraction expressions?

Solving fraction expressions is useful in areas like measurements, cooking, engineering, and finance where precise fractional calculations are needed.

How do I verify my answer when subtracting multiple fractions?

You can verify your answer by converting all fractions to decimals and checking if the subtraction yields the same result, or by cross-multiplying to confirm the common denominator calculations.

Additional Resources

$\frac{3}{2} - \frac{5}{6} - \frac{2}{9}$ Answer Please: An In-Depth Investigation into Fractional Expressions and Their Solutions

In the realm of mathematics, fractions are fundamental building blocks that serve as the bridge between whole numbers and rational numbers. They permeate various branches of mathematics, from basic arithmetic to complex algebraic and calculus concepts. Among the diverse types of fractional expressions, the sequence " $\frac{3}{2} - \frac{5}{6} - \frac{2}{9}$ " appears simple at first glance but opens the door to a nuanced exploration of fraction operations, simplification techniques, and problem-solving strategies. This article undertakes a detailed investigation into this expression, examining its components, the methods to evaluate it accurately, and its broader mathematical significance.

Understanding the Expression: $\frac{3}{2} - \frac{5}{6} - \frac{2}{9}$

At its core, the expression involves three fractions combined through subtraction. To evaluate it accurately, one must understand the properties of fractions, the importance of common denominators, and the process of simplifying results.

Components Breakdown

- First term: $\frac{3}{2}$
- Second term: $\frac{5}{6}$
- Third term: $\frac{2}{9}$

Each term has unique numerator and denominator combinations that require careful handling to combine correctly.

The Objective

Calculate the value of the entire expression:

$$\left[\frac{3}{2} - \frac{5}{6} - \frac{2}{9} \right]$$

and interpret the result within a mathematical or real-world context.

Methodology for Solving the Expression

The key to solving such fractional expressions lies in understanding and applying the rules for operations with fractions, primarily focusing on finding a common denominator and performing addition or subtraction accurately.

Step 1: Find the Least Common Denominator (LCD)

The denominators are 2, 6, and 9.

- Prime factorization:

- $2 = 2$

- $6 = 2 \times 3$

- $9 = 3^2$

- The LCD is the least common multiple of these denominators:

- LCM of 2, 6, and 9:

- 2 (from 2)

- 3 (from 6 and 9)

- 3^2 (from 9)

Therefore, $\text{LCD} = 2 \times 3^2 = 2 \times 9 = 18$

Step 2: Convert Each Fraction to Equivalent Fractions with Denominator 18

- $\left(\frac{3}{2} = \frac{3 \times 9}{2 \times 9} = \frac{27}{18} \right)$

- $\left(\frac{5}{6} = \frac{5 \times 3}{6 \times 3} = \frac{15}{18} \right)$

- $\left(\frac{2}{9} = \frac{2 \times 2}{9 \times 2} = \frac{4}{18} \right)$

Step 3: Rewrite the Expression

$$\left[\frac{27}{18} - \frac{15}{18} - \frac{4}{18} \right]$$

Step 4: Combine the Fractions

Since all fractions share a common denominator, combine their numerators:

$$\left[\frac{27 - 15 - 4}{18} = \frac{8}{18} \right]$$

Step 5: Simplify the Result

- Both numerator and denominator can be divided by 2:

$$\left[\frac{8 \div 2}{18 \div 2} = \frac{4}{9} \right]$$

Final Answer:

$$\left[\boxed{\frac{4}{9}} \right]$$

Deeper Analysis: Significance of the Result

The simplified answer, $\frac{4}{9}$, is a proper fraction less than 1, indicating that the combined subtractive process results in a fractional value that is less than a whole. This has implications in various contexts where ratios, proportions, or parts of a whole are involved.

Mathematical Significance

- Fractional operations: The process highlights the importance of common denominators in fractional subtraction.
- Simplification: Demonstrates how to reduce fractions to their simplest form for clarity and ease of interpretation.
- Numerical intuition: Recognizes that subtracting larger fractions from smaller ones results in a smaller, often fractional, value.

Practical Applications

- Financial calculations: Determining remaining shares or proportions.

- Measurement conversions: Combining parts of measurements expressed in different units or scales.
- Probability and statistics: Calculating combined probabilities or ratios.

Common Pitfalls and Troubleshooting

While the above steps seem straightforward, learners and practitioners should be vigilant about common errors:

- Incorrect LCD calculation: Failing to find the least common multiple can lead to incorrect conversions.
- Arithmetic mistakes in numerator operations: Subtracting numerators without proper alignment can cause errors.
- Neglecting simplification: Not reducing fractions to their simplest form may obscure the true value or cause misinterpretation.

Extensions and Advanced Considerations

The basic concept extends beyond simple subtraction of fractions. Advanced explorations include:

Adding and Subtracting Multiple Fractions

- Handling more complex expressions involving addition, subtraction, multiplication, and division.
- Incorporating algebraic fractions with variables.

Fractional Expressions in Calculus

- Limits involving fractions approaching zero or infinity.
- Derivatives and integrals involving rational functions.

Applications in Real-World Data Analysis

- Ratios in datasets.
- Normalized scores and proportions.

Summary and Conclusion

The expression $\frac{3}{2} - \frac{5}{6} - \frac{2}{9}$ exemplifies the essential skills required in fractional arithmetic: finding common denominators, converting to equivalent fractions, performing operations accurately, and simplifying the result. Through methodical application of these principles, we arrive at the simplified answer of $\frac{4}{9}$.

This exercise not only reinforces fundamental mathematical concepts but also demonstrates their relevance in practical scenarios, from financial calculations to scientific data analysis. Mastery of such fractional operations is crucial for advancing in mathematics and related disciplines, fostering analytical thinking and problem-solving skills.

In the broader scope, such investigations highlight the importance of precision, methodological rigor, and clarity in mathematical reasoning—values that underpin all scientific and quantitative pursuits. Whether used in academic settings or real-world applications, understanding how to manipulate and interpret fractions remains an indispensable skill for learners and professionals alike.

In conclusion, the answer to $\frac{3}{2} - \frac{5}{6} - \frac{2}{9}$ is $\frac{4}{9}$, a result achieved through careful calculation and deep understanding of fraction operations. This exploration underscores the importance of foundational mathematical techniques and their wide-ranging applications, serving as a testament to the enduring significance of fractions in the world of mathematics.

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