

Find The Sum. $\frac{1}{3} + \frac{1}{3} + \frac{1}{8}$ A. $\frac{3}{14}$ B. $\frac{3}{11}$ C. $\frac{19}{24}$ D. $\frac{6}{8}$

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Understanding how to find the sum of fractions is a fundamental skill in mathematics that helps in solving a variety of real-world problems, from basic calculations to complex engineering tasks. In this article, we will explore the process of adding fractions, specifically focusing on the problem: $\frac{1}{3} + \frac{1}{3} + \frac{1}{8}$. We will also analyze the possible answer choices— $\frac{3}{14}$, $\frac{3}{11}$, $\frac{19}{24}$, and $\frac{6}{8}$ —to identify the correct sum. By the end of this comprehensive guide, you'll be equipped with the knowledge and techniques necessary to confidently solve similar fraction addition problems.

Understanding Fractions and Their Addition

What Are Fractions?

A fraction represents a part of a whole. It consists of two parts:

- Numerator: The top number, indicating how many parts are being considered.
- Denominator: The bottom number, indicating the total number of equal parts the whole is divided into.

For example, in $\frac{1}{3}$:

- Numerator = 1
- Denominator = 3

This means one part out of three equal parts.

Adding Fractions: Basic Principles

Adding fractions involves combining parts of a whole, but the denominators must be compatible. The key steps include:

1. Finding a common denominator if the fractions have different denominators.
2. Converting fractions to equivalent fractions with the common denominator.
3. Adding numerators while keeping the common denominator.
4. Simplifying the resulting fraction if possible.

Step-by-Step Solution for the Sum $\frac{1}{3} + \frac{1}{3} + \frac{1}{8}$

Step 1: Identify the Fractions

The fractions involved are:

- $\frac{1}{3}$
- $\frac{1}{3}$
- $\frac{1}{8}$

Step 2: Find the Least Common Denominator (LCD)

To add fractions with different denominators, find the least common multiple (LCM) of the denominators:

- Denominators are 3, 3, and 8.
- LCM of 3 and 8:
 - Multiples of 3: 3, 6, 9, 12, 15, 18, 21, 24, ...
 - Multiples of 8: 8, 16, 24, 32, ...
 - The smallest common multiple is 24.

Thus, the LCD is 24.

Step 3: Convert Each Fraction to an Equivalent Fraction with Denominator 24

- For $\frac{1}{3}$:
 - Multiply numerator and denominator by 8:
 - $\frac{1}{3} = \frac{(1 \times 8)}{(3 \times 8)} = \frac{8}{24}$
- For the second $\frac{1}{3}$:
 - Same as above: $\frac{8}{24}$
- For $\frac{1}{8}$:
 - Multiply numerator and denominator by 3:
 - $\frac{1}{8} = \frac{(1 \times 3)}{(8 \times 3)} = \frac{3}{24}$

Step 4: Add the Fractions

Now, sum the numerators:

- $\frac{8}{24} + \frac{8}{24} + \frac{3}{24} = \frac{(8 + 8 + 3)}{24} = \frac{19}{24}$

Step 5: Simplify the Result (if possible)

- The fraction $19/24$ is already in its simplest form because numerator and denominator share no common factors other than 1.

Identifying the Correct Answer

Based on the calculation above, the sum of $1/3 + 1/3 + 1/8$ is $19/24$.

Matching this with the provided options:

- A. $3/14$
- B. $3/11$
- C. $19/24$
- D. $6/8$

The correct choice is C. $19/24$.

Understanding Why the Other Options Are Incorrect

Let's briefly analyze why the other options do not match our calculated sum:

Option A: $3/14$

- $3/14$ is a simplified fraction with a denominator of 14, which is not related to our sum of $19/24$.
- Our sum is approximately 0.79, while $3/14 \approx 0.214$, so they are not equivalent.

Option B: $3/11$

- $3/11 \approx 0.272$, which is less than our sum.
- Not matching the actual sum of $19/24$.

Option D: $6/8$

- Simplifies to $3/4$, which is 0.75.
- Our sum is $19/24 \approx 0.79$, so not equivalent.

Additional Tips for Adding Fractions

- Always find the least common denominator to simplify calculations.
- Convert fractions carefully to avoid errors.
- Simplify the final answer to its lowest terms for clarity.
- Double-check calculations by converting the final fraction to decimal form to verify accuracy.

Practical Applications of Fraction Addition

Adding fractions is not just an academic exercise; it has real-world applications, including:

- Cooking and recipes: Combining parts of ingredients.
- Construction and carpentry: Adding lengths or areas expressed as fractions.
- Finance: Calculating proportions and shares.
- Science and engineering: Combining measurements and ratios.

Understanding how to accurately perform these calculations ensures precision in various fields.

Conclusion

Adding fractions like $\frac{1}{3} + \frac{1}{3} + \frac{1}{8}$ involves finding a common denominator, converting fractions to equivalent forms, and then summing the numerators. In this specific problem, the correct answer is $\frac{19}{24}$, which matches option C. Mastering the process of fraction addition enhances problem-solving skills and provides a solid foundation for more advanced mathematical concepts. Remember to always simplify your fractions and verify your results for accuracy.

Meta Description:

Learn how to find the sum of $\frac{1}{3} + \frac{1}{3} + \frac{1}{8}$ with step-by-step instructions. Discover the correct answer among options $\frac{3}{14}$, $\frac{3}{11}$, $\frac{19}{24}$, and $\frac{6}{8}$. Perfect guide for students and math enthusiasts!

Frequently Asked Questions

What is the sum of $\frac{1}{3} + \frac{1}{3} + \frac{1}{8}$?

The sum is $\frac{19}{24}$.

How do you add fractions with different denominators, such as $\frac{1}{3}$ and $\frac{1}{8}$?

Find a common denominator (24), convert each fraction, then add: $\frac{8}{24} + \frac{8}{24} + \frac{3}{24} = \frac{19}{24}$.

What is the simplified form of the sum $\frac{1}{3} + \frac{1}{3} + \frac{1}{8}$?

The simplified sum is $\frac{19}{24}$, which is already in its simplest form.

Which option correctly represents the sum of $\frac{1}{3} + \frac{1}{3} + \frac{1}{8}$?

Option C: $\frac{19}{24}$.

Can the sum $\frac{19}{24}$ be expressed as a mixed number?

No, $\frac{19}{24}$ is a proper fraction and cannot be expressed as a mixed number.

What is the least common denominator for adding $\frac{1}{3}$ and $\frac{1}{8}$?

The least common denominator is 24.

How do you verify the correct sum among multiple-choice options?

Calculate the sum step-by-step and compare it with the options; in this case, the sum is $\frac{19}{24}$, matching option C.

Is $\frac{19}{24}$ equivalent to any of the other options listed?

No, $\frac{19}{24}$ is unique; it does not simplify to any other options like $\frac{3}{14}$, $\frac{3}{11}$, or $\frac{6}{8}$.

Additional Resources

Find The Sum: An In-Depth Analysis of the Expression $\frac{1}{3} + \frac{1}{3} + \frac{1}{8}$

In the realm of basic arithmetic, the process of summing fractions is a fundamental skill that underpins

more advanced mathematical concepts. The problem at hand involves calculating the sum of three fractions: $\frac{1}{3} + \frac{1}{3} + \frac{1}{8}$. While seemingly straightforward, this exercise offers an insightful look into the techniques of finding common denominators, simplifying fractions, and choosing the correct answer from multiple options. In this article, we will explore the problem in depth, breaking down each step of the calculation process, analyzing the options provided, and emphasizing the importance of mastering such fundamental operations.

Understanding the Problem: What Are We Calculating?

The Expression: $\frac{1}{3} + \frac{1}{3} + \frac{1}{8}$

The mathematical expression involves summing three fractions:

- Two instances of $\frac{1}{3}$
- One instance of $\frac{1}{8}$

The goal is to compute their total sum and identify the correct answer choice from the options provided: A. $\frac{3}{14}$, B. $\frac{3}{11}$, C. $\frac{19}{24}$, D. $\frac{6}{8}$.

This task is emblematic of fraction addition, a skill that often confuses students due to the requirement of finding a common denominator. It also demonstrates the importance of accurate calculation and understanding of fraction simplification.

Step-by-Step Solution Process

1. Recognize the Need for a Common Denominator

When adding fractions, the denominators must be the same. Here, we have denominators 3 and 8, which are different, so we need to find a common denominator.

- Denominators: 3, 3, and 8
- Common denominator: Least Common Multiple (LCM) of 3 and 8

2. Find the Least Common Multiple (LCM) of 3 and 8

- Prime factors of 3: 3
- Prime factors of 8: $2 \times 2 \times 2$

The LCM is obtained by taking the highest powers of all prime factors:

- 2^3 (from 8)
- 3 (from 3)

$$\text{LCM} = 2^3 \times 3 = 8 \times 3 = 24$$

Thus, the common denominator is 24.

3. Convert Each Fraction to an Equivalent Fraction with Denominator 24

- For $\frac{1}{3}$:

Multiply numerator and denominator by 8:

$$\frac{1}{3} = \frac{(1 \times 8)}{(3 \times 8)} = \frac{8}{24}$$

- For the second $\frac{1}{3}$:

Same as above:

$$\frac{8}{24}$$

- For $\frac{1}{8}$:

Multiply numerator and denominator by 3:

$$\frac{1}{8} = \frac{(1 \times 3)}{(8 \times 3)} = \frac{3}{24}$$

4. Sum the Fractions

Now, sum the equivalent fractions:

$$- \frac{8}{24} + \frac{8}{24} + \frac{3}{24} = (8 + 8 + 3) / 24 = 19/24$$

Hence, the sum of $\frac{1}{3} + \frac{1}{3} + \frac{1}{8}$ is $\frac{19}{24}$.

Analyzing the Answer Choices

Let's revisit the options:

- A. $\frac{3}{14}$
- B. $\frac{3}{11}$
- C. $\frac{19}{24}$
- D. $\frac{6}{8}$

From our calculation, the sum is $\frac{19}{24}$, which directly corresponds to option C.

Understanding the Significance of the Correct Answer

Why is $\frac{19}{24}$ the correct choice?

The process of adding fractions hinges on accurate conversion to a common denominator and careful addition of numerators. The calculation confirms that the sum is $\frac{19}{24}$, a simplified proper fraction. Its proximity to 1 indicates that the total is just slightly less than a whole, which aligns with the sum of two-thirds plus one-eighth.

Implications in Mathematical Learning

This problem exemplifies the importance of:

- Recognizing the least common multiple as a key step.
- Converting fractions accurately before addition.
- Simplifying fractions where necessary.
- Carefully matching calculated results with multiple-choice options.

Mastery of such steps is crucial for progressing to more advanced topics like algebra, ratios, and percentages.

Broader Context and Applications

The Role of Fraction Addition in Real-World Scenarios

Adding fractions is not just an academic exercise; it has practical applications in various fields:

- Cooking: Combining measurements like $\frac{1}{3}$ cup + $\frac{1}{3}$ cup + $\frac{1}{8}$ cup.
- Construction: Adding fractional lengths or measurements.
- Finance: Calculating parts of investments or interest rates expressed as fractions.
- Science: Combining ratios or proportions in experiments.

Understanding how to accurately perform these calculations ensures precision and reliability in real-world tasks.

Challenges Faced in Fraction Addition

Despite its straightforward nature, many learners encounter common pitfalls:

- Forgetting to find the least common denominator.
- Incorrectly converting fractions.
- Adding numerators without aligning denominators.
- Forgetting to simplify the resulting fraction.

Awareness and practice alleviate these issues, making fraction addition an intuitive skill.

Conclusion: The Significance of Accurate Calculation and Critical Thinking

The problem of summing $\frac{1}{3} + \frac{1}{3} + \frac{1}{8}$ underscores the importance of systematic procedures in mathematics. By methodically identifying the least common denominator, converting fractions accurately, and performing correct addition, we arrive at the sum of $\frac{19}{24}$. This calculation not only demonstrates fundamental arithmetic principles but also highlights the importance of critical thinking when selecting the correct answer from multiple choices.

In a broader sense, mastering such basic operations builds a solid foundation for more complex mathematical concepts and real-life problem-solving. Whether in academic settings or everyday situations, the ability to add fractions accurately is an essential skill that fosters confidence and competence in quantitative reasoning.

In summary, the correct answer to the problem $\frac{1}{3} + \frac{1}{3} + \frac{1}{8}$ is C. $\frac{19}{24}$, a conclusion reached through careful step-by-step analysis. As learners and enthusiasts of mathematics, embracing these fundamental techniques ensures a deeper understanding and prepares us for more advanced challenges ahead.

Find The Sum 1 3 1 3 1 8 A 3 14 B 3 11 C 19 24 D 6 8

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