

Evaluate $1/521/5$ Give Your Answer As A Mixed Number In Its Simplest Form.

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Evaluate $1/521/5$ Give Your Answer As A Mixed Number In Its Simplest Form. This problem involves understanding how to interpret complex fractional expressions, perform calculations accurately, and simplify the resulting mixed number to its simplest form. To effectively analyze and solve this problem, it is essential to understand the structure of the expression, the order of operations, and the methods for simplifying fractions and mixed numbers.

Understanding the Expression

Breaking Down the Expression

The given expression is: $1/521/5$. At first glance, it appears to be a sequence of fractions or a fraction with nested components. To interpret it correctly, consider the common conventions in mathematical notation:

- If the expression is written as $1/521/5$, it often implies a chain of divisions: 1 divided by 521 divided by 5.
- Alternatively, it could be interpreted as a single fraction: 1 divided by (521 divided by 5).
- Parentheses are typically used to clarify the intended order of operations. Since none are explicitly provided, standard conventions suggest the expression likely means 1 divided by the entire denominator, which itself involves a division: 521 divided by 5.

Therefore, the most logical interpretation is:

$$1 / (521 / 5)$$

which simplifies to:

$$1 \text{ divided by } (521 / 5)$$

This interpretation aligns with standard mathematical notation and ensures clarity in solving the problem.

Step-by-Step Solution Process

Step 1: Simplify the Denominator

The denominator is 521 divided by 5. To compute this:

1. Divide 521 by 5:
2. Perform the division: $521 \div 5$

Calculating $521 \div 5$:

- 5 goes into 52 ten times ($5 \times 10 = 50$), with a remainder of 2.
- Bring down the 1, making it 21.
- 5 goes into 21 four times ($5 \times 4 = 20$), with a remainder of 1.

Expressed as a decimal:

$$521 \div 5 = 104.2$$

Alternatively, as a fraction:

$$521 \div 5 = 521/5 \text{ (which is the original form)}$$

But since we're dividing 521 by 5, the exact fractional form remains $521/5$, and the decimal form is 104.2.

Step 2: Rewrite the Expression

Now, the original expression becomes:

$$1 / (521 / 5)$$

which simplifies to:

$$1 \times (5 / 521) = 5 / 521$$

Thus, the value of the entire expression is **$5/521$** .

Step 3: Convert the Fraction to a Mixed Number

Next, convert the fraction $5/521$ into a mixed number in its simplest form.

Since 5 is less than 521, the fraction is proper, and as a mixed number, it would be:

$$0 \frac{5}{521}$$

which is simply $\frac{5}{521}$, as it cannot be expressed as a mixed number with a whole part greater than zero.

Step 4: Simplify the Fraction

Check if $\frac{5}{521}$ can be simplified further:

- Find the greatest common divisor (GCD) of 5 and 521.

Finding the GCD of 5 and 521

- Prime factors of 5: 5
- Prime factors of 521:
 - $521 \div 13 = 40.07$ (not an integer), so 13 isn't a factor
 - Check divisibility by 17: $17 \times 30 = 510$, $17 \times 31 = 527$, so 17 isn't a factor
 - Check divisibility by 521 itself: 521 is prime, as it has no divisors other than 1 and itself.

Since 521 is a prime number and doesn't share any common factors with 5 (other than 1), the GCD is 1.

Therefore, the fraction $\frac{5}{521}$ is already in its simplest form.

Final Answer and Interpretation

Expressing the Result as a Mixed Number

Since $\frac{5}{521}$ is a proper fraction (numerator less than denominator), it cannot be expressed as a mixed number with a whole number part greater than zero. Therefore, the answer in its simplest form remains:

$$\frac{5}{521}$$

which is already simplified.

Summary of the Solution

- Interpreted the expression as 1 divided by (521 divided by 5).
- Simplified the denominator to $521/5$.
- Calculated the overall value as $5/521$.
- Confirmed that $5/521$ is in simplest form and cannot be expressed as a mixed number with a whole part.

Additional Considerations

Alternative Interpretations

While the interpretation above is most consistent with standard notation, it's important to address other possible readings of the expression:

1. **Sequential Fractions:** If the expression was meant as $(1/521)/5$, then:
 - Calculate $1/521$ first.
 - Divide that result by 5:
2. Result: $(1/521) \div 5 = 1/521 \times 1/5 = 1/2605$.
3. Expressed as a mixed number: $1/2605$, which remains proper and cannot be simplified further.

Given the problem statement and common practices, the initial interpretation (1 divided by $521/5$) is more likely intended, but it's useful to consider alternate structures for comprehensive understanding.

Conclusion

In conclusion, after carefully analyzing the expression and performing the necessary calculations, the value of $1/(521/5)$, interpreted as 1 divided by (521 divided by 5), simplifies to the fraction **$5/521$** . Since the numerator and denominator share no common factors other than 1, it is already in its simplest form. As a proper fraction with numerator less than denominator, it cannot be expressed as a mixed number with a whole part. Therefore, the final answer remains:

This problem exemplifies the importance of understanding notation, applying basic arithmetic, and simplifying fractions to arrive at the correct and simplest form of an expression. Mastery of these skills ensures accurate problem-solving in a variety of mathematical contexts.

Frequently Asked Questions

How do I evaluate the expression $1/5 \div 2/5$ and express it as a simplified mixed number?

To evaluate $1/5 \div 2/5$, multiply $1/5$ by the reciprocal of $2/5$, which is $5/2$: $(1/5) \times (5/2) = 5/10 = 1/2$. As a mixed number, $1/2$ remains $1/2$ since it's already in simplest form.

What steps should I follow to convert the division of fractions into a mixed number in simplest form?

First, perform the division by multiplying by the reciprocal. Then, simplify the resulting fraction. If the result is an improper fraction, convert it to a mixed number in its simplest form by dividing numerator by denominator and simplifying the fractional part.

Is $1/5 \div 2/5$ equal to $1/2$? How do I verify this?

Yes, $1/5 \div 2/5$ equals $1/2$. Verify by multiplying $1/2$ by $2/5$: $(1/2) \times (2/5) = 2/10 = 1/5$, confirming the original division result.

How can I simplify the mixed number result of a division problem like $1/5 \div 2/5$?

After performing the division, simplify the resulting fraction by dividing numerator and denominator by their greatest common divisor (GCD). If the result is an improper fraction, convert it to a mixed number in its simplest form.

What is the importance of simplifying fractions and mixed numbers after division?

Simplifying fractions and mixed numbers makes the result easier to understand, compare, and use in further calculations. It ensures the answer is in its most reduced and standard form.

Can the division of $1/5$ by $2/5$ be expressed as a mixed number directly?

Since $1/5 \div 2/5$ equals $1/2$, which is a proper fraction, it can be expressed as a mixed number only if desired as $0 \frac{1}{2}$. Typically, it's simplest to leave it as $1/2$.

Why is it important to give your answer as a mixed number in its simplest form?

Expressing answers as mixed numbers in their simplest form provides clarity, accuracy, and ensures the result is easily understood and usable in further calculations or real-world applications.

How do I convert improper fractions to mixed numbers after division?

Divide the numerator by the denominator to get the whole number part, and find the remainder. The remainder over the original denominator forms the fractional part. Simplify if possible to get the mixed number in simplest form.

Additional Resources

Evaluate $1/521/5$ Give Your Answer As A Mixed Number In Its Simplest Form

When working with fractions, one common task is to evaluate complex expressions and convert the result into a mixed number in its simplest form. The problem "Evaluate $1/521/5$ Give Your Answer As A Mixed Number In Its Simplest Form" involves understanding how to manipulate fractions, perform division, and simplify the final result. This guide aims to walk you through the entire process step-by-step, providing clarity and confidence in handling similar questions in mathematics.

Understanding the Problem

Before diving into calculations, it's essential to interpret the problem correctly. The key phrase here is "Evaluate $1/521/5$ ", which might seem ambiguous at first glance. Typically, when encountering such notation, it suggests an expression involving division or a sequence of operations involving fractions.

Clarifying the Expression

The expression " $1/521/5$ " can be interpreted in a few ways:

- Interpretation 1: $\left(\frac{1}{521}\right) \div 5$
- Interpretation 2: $\frac{1}{\left(\frac{521}{5}\right)}$

Given the phrasing, the most common and logical interpretation is the first: "1 divided by 521 divided by 5" or mathematically:

$$\left(\frac{1}{521}\right) \div 5$$

This interpretation aligns with standard mathematical notation and the instruction to give the answer as a mixed number, which suggests a division of fractions or mixed fractions.

Step 1: Express the Problem Clearly

Based on the most probable interpretation, the problem reduces to:

Evaluate:

$$\frac{1}{521} \div 5$$

and then express the answer as a mixed number in its simplest form.

Step 2: Recall the Division of Fractions Rule

Dividing by a whole number (or any number) can be handled by converting the number into a fraction and multiplying by its reciprocal:

$$a \div b = a \times \frac{1}{b}$$

Therefore,

$$\frac{1}{521} \div 5 = \frac{1}{521} \times \frac{1}{5}$$

Step 3: Perform the Multiplication

Multiplying two fractions involves multiplying the numerators and denominators:

$$\frac{1}{521} \times \frac{1}{5} = \frac{1 \times 1}{521 \times 5} = \frac{1}{2605}$$

So, the value of the expression "1/521/5" is:

$$\boxed{\frac{1}{2605}}$$

Step 4: Convert the Fraction to a Mixed Number

Since $\frac{1}{2605}$ is a proper fraction (numerator less than denominator), it cannot be expressed as a mixed number with an integer part greater than zero. The mixed number for a proper fraction is simply:

$$0 \frac{1}{2605}$$

which is usually written as " $0 \frac{1}{2605}$ ".

Step 5: Simplify the Fraction

Is $\frac{1}{2605}$ in its simplest form? To confirm, check if numerator and denominator share any common factors other than 1:

- Numerator: 1
- Denominator: 2605

Since 1 is only divisible by 1, and 2605 is greater than 1, the fraction $\frac{1}{2605}$ is already in simplest form.

Final Answer

The evaluated expression, expressed as a mixed number in its simplest form, is:

$$0 \frac{1}{2605}$$

or simply,

$$\frac{1}{2605}$$

since the integer part is zero.

Additional Insights and Clarifications

When to Use Mixed Numbers

A mixed number is used when the fraction is improper, i.e., the numerator is larger than the denominator, and the value exceeds 1. Since $\frac{1}{2605}$ is a proper fraction, expressing it as a mixed number with an integer part of zero is standard but often omitted for simplicity.

Alternative Interpretations

If the original problem intended a different interpretation, such as:

- "1 divided by (521 divided by 5)":

$$\frac{1}{\left(\frac{521}{5}\right)} = 1 \times \frac{5}{521} = \frac{5}{521}$$

which is also a proper fraction and in simplest form.

- "Evaluate the mixed number 521/5" and then divide 1 by it:

$$\frac{521}{5} = 104 \frac{1}{5}$$

then,

$$1 \div 104 \frac{1}{5}$$

which involves converting the mixed number to an improper fraction and performing division.

Summary and Key Takeaways

- Always clarify the expression before proceeding with calculations.
- Convert division problems into multiplication by the reciprocal for ease.
- Simplify fractions by dividing numerator and denominator by their greatest common divisor (GCD).
- Proper fractions are best left as such; mixed numbers are used for improper fractions.
- When in doubt, express all parts as improper fractions to simplify calculations.

Final Thoughts

Handling fractions and mixed numbers requires careful interpretation of the problem, precise calculations, and attention to simplification. In the case of "Evaluate 1/521/5 Give Your Answer As A Mixed Number In Its Simplest Form," the most logical interpretation leads us to the answer:

$$0 \left(\frac{1}{2605}\right)$$

which, in simplified form, remains as $\left(\frac{1}{2605}\right)$. This process exemplifies the importance of understanding fraction operations, conversion techniques, and the significance of expressing answers clearly in their simplest forms.

Remember: Practice makes perfect. The more you work with fractions and mixed numbers, the more intuitive these processes will become. Whether dealing with simple fractions or complex expressions, the core principles remain the same—clarify, convert, compute, and simplify.

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