

I Need To Solve $6\frac{2}{3} - 21/6$

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When faced with the problem of subtracting mixed numbers like $6\frac{2}{3}$ and $21/6$, it's common to feel a bit overwhelmed at first. However, understanding the process step-by-step can make solving such problems straightforward and even enjoyable. In this article, we will explore how to approach and solve the expression $6\frac{2}{3} - 21/6$ in detail, providing clarity for learners of all levels. Whether you're a student practicing fractions or someone brushing up on math skills, this guide will walk you through every step to ensure you understand the process thoroughly.

Understanding the Problem

Before diving into solving the problem, it's essential to understand what the expression $6\frac{2}{3} - 21/6$ represents. This is a subtraction involving a mixed number ($6\frac{2}{3}$) and a proper or improper fraction ($21/6$). To perform this subtraction accurately, it's often easiest to convert mixed numbers into improper fractions, perform the subtraction, and then convert back if necessary.

What Is a Mixed Number?

- A mixed number combines a whole number and a fractional part.
- Example: $6\frac{2}{3}$ means 6 plus $2/3$.

What Is an Improper Fraction?

- An improper fraction has a numerator larger than or equal to the denominator.
- Example: $21/6$ is an improper fraction because 21 is greater than 6.

Step-by-Step Approach to Solving $6\frac{2}{3} - 21/6$

To solve this problem efficiently, follow these steps:

Step 1: Convert the Mixed Number to an Improper Fraction

- For $6\frac{2}{3}$:
- Multiply the whole number (6) by the denominator (3): $6 \times 3 = 18$
- Add the numerator (2): $18 + 2 = 20$
- The improper fraction becomes $20/3$

Step 2: Rewrite the Expression with Both Fractions as Improper Fractions

- The original problem:
- $6 \frac{2}{3} - \frac{21}{6}$
- Convert $6 \frac{2}{3}$ to $\frac{20}{3}$:
- Now, the expression is:
- $\frac{20}{3} - \frac{21}{6}$

Step 3: Find a Common Denominator

- To subtract fractions, they need the same denominator.
- The denominators are 3 and 6.
- The least common denominator (LCD) of 3 and 6 is 6.

Step 4: Convert Fractions to Equivalent Fractions with the LCD

- Convert $\frac{20}{3}$ to a fraction with denominator 6:
- Multiply numerator and denominator by 2:
- $(20 \times 2) / (3 \times 2) = \frac{40}{6}$
- The expression becomes:
- $\frac{40}{6} - \frac{21}{6}$

Step 5: Subtract the Fractions

- Since the denominators are now the same, subtract the numerators:
- $40 - 21 = 19$
- The result is:
- $\frac{19}{6}$

Step 6: Simplify the Result

- $\frac{19}{6}$ is an improper fraction.
- Convert back to a mixed number:
- Divide numerator by denominator:
- $19 \div 6 = 3$ with a remainder of 1
- So, $\frac{19}{6} = 3 \frac{1}{6}$

Final Answer

$$\boxed{3 \frac{1}{6}}$$

The result of subtracting $2\frac{1}{6}$ from $6\frac{2}{3}$ is $3\frac{1}{6}$.

Additional Tips for Solving Fractions and Mixed Numbers

To improve your skills in handling similar problems, consider the following tips:

- **Always convert mixed numbers to improper fractions before performing operations.** This simplifies calculations and reduces errors.
- **Find the least common denominator (LCD) when adding or subtracting fractions.** This ensures fractions are comparable.
- **Simplify the final answer if possible.** Converting improper fractions to mixed numbers often makes the result easier to interpret.
- **Use a calculator for complex fractions, but always understand the manual process.** This helps reinforce your understanding of fraction operations.

Common Mistakes to Avoid

While solving fraction problems like $6\frac{2}{3} - 2\frac{1}{6}$, learners often make some common errors. Being aware of these can help you avoid pitfalls:

1. **Not converting mixed numbers to improper fractions:** This can complicate subtraction and lead to incorrect answers.
2. **Using different denominators without finding the LCD:** This results in incorrect fraction operations.
3. **Incorrectly subtracting numerators:** Always ensure the fractions are expressed with the same denominator.
4. **Forgetting to simplify the final answer:** Always check if the fraction can be reduced or converted to a mixed number.

Practice Problems for Mastery

To reinforce your understanding, try solving these similar problems:

1. Convert and subtract: $4\frac{1}{2} - \frac{7}{4}$
2. Simplify: $5\frac{3}{4} - 2\frac{2}{3}$
3. Find the difference: $9\frac{2}{5} - 11\frac{1}{5}$
4. Solve: $3\frac{2}{7} - 10\frac{1}{7}$

Work through each problem using the steps outlined above: convert mixed numbers, find common denominators, subtract, and simplify.

Conclusion

Understanding how to subtract mixed numbers like $6\frac{2}{3}$ and fractions like $\frac{21}{6}$ is an essential skill in mathematics. By converting mixed numbers to improper fractions, finding common denominators, performing the subtraction, and simplifying the result, you can confidently solve similar problems with ease. Remember, practice makes perfect. Regularly working through fraction problems enhances your numerical literacy and problem-solving skills.

With this comprehensive guide, you now have a clear roadmap to tackle the problem $6\frac{2}{3} - \frac{21}{6}$ and other related fraction operations confidently. Keep practicing, and you'll master fractions in no time!

Frequently Asked Questions

How do I subtract mixed numbers like $6\frac{2}{3}$ and $\frac{21}{6}$?

First, convert mixed numbers to improper fractions, then find a common denominator and subtract the fractions accordingly.

What is the first step to solve $6\frac{2}{3} - \frac{21}{6}$?

Convert $6\frac{2}{3}$ to an improper fraction, which is $\frac{20}{3}$, then write both fractions with a common denominator.

What is $6\frac{2}{3}$ expressed as an improper fraction?

$6\frac{2}{3}$ is equal to $\frac{20}{3}$.

How do I find a common denominator for $\frac{20}{3}$ and $\frac{21}{6}$?

The least common denominator (LCD) of 3 and 6 is 6. Convert $\frac{20}{3}$ to $\frac{40}{6}$ for easy subtraction.

What is the result of subtracting $\frac{21}{6}$ from $\frac{20}{3}$?

Convert both to have denominator 6: $\frac{20}{3} = \frac{40}{6}$, then subtract $\frac{40}{6} - \frac{21}{6} = \frac{19}{6}$.

How do I convert $\frac{19}{6}$ back to a mixed number?

Divide 19 by 6: $19 \div 6 = 3$ with a remainder of 1, so $\frac{19}{6} = 3\frac{1}{6}$.

What is the final answer to $6\frac{2}{3} - \frac{21}{6}$?

The answer is $3\frac{1}{6}$.

Additional Resources

I Need To Solve $6\frac{2}{3} - \frac{21}{6}$: A Comprehensive Guide to Simplifying Mixed and Improper Fractions

Mathematics often involves working with fractions, and understanding how to manipulate and subtract them accurately is an essential skill. When faced with a problem like "I Need To Solve $6\frac{2}{3} - \frac{21}{6}$," students and learners might feel overwhelmed or unsure of where to begin. This article aims to guide you step-by-step through the process of solving this problem, unraveling the concepts of mixed numbers and improper fractions, and demonstrating effective methods to arrive at the correct answer. Whether you're studying for an exam, brushing up on your math skills, or simply curious about fractions, this detailed exploration will clarify the process and deepen your understanding.

Understanding the Problem

Before diving into the solution, it's crucial to interpret what the problem asks. The expression is:

$$6\frac{2}{3} - \frac{21}{6}$$

This involves a mixed number $6\frac{2}{3}$ and an improper fraction $\frac{21}{6}$. To work effectively with these quantities, converting them into a common form—preferably improper fractions—makes subtraction straightforward.

Converting Mixed Numbers to Improper Fractions

What is a Mixed Number?

A mixed number combines a whole number and a fractional part. In this problem, $6 \frac{2}{3}$ signifies 6 whole units plus $\frac{2}{3}$ of a unit.

How to Convert a Mixed Number to an Improper Fraction

To convert $6 \frac{2}{3}$ into an improper fraction:

1. Multiply the whole number by the denominator:
- $6 \times 3 = 18$
2. Add the numerator:
- $18 + 2 = 20$
3. Write the result over the original denominator:
- $\frac{20}{3}$

Thus, $6 \frac{2}{3} = \frac{20}{3}$.

Purpose of Conversion

Converting mixed numbers to improper fractions simplifies the subtraction process, as it allows us to work with a common denominator directly, facilitating straightforward arithmetic.

Expressing Both Quantities with Common Denominators

Analyzing the Fractions

The second term, $\frac{21}{6}$, is already an improper fraction. To subtract, both fractions should ideally have the same denominator.

Finding a Common Denominator

- The denominators are 3 and 6.

- The least common denominator (LCD) is 6, since 6 is divisible by 3.

Rewriting Fractions with the Common Denominator

- Convert $20/3$ to sixths:
- Multiply numerator and denominator by 2:
- $(20 \times 2) / (3 \times 2) = 40/6$
- The second fraction remains $21/6$.

Now, the problem becomes:

$$40/6 - 21/6$$

Performing the Subtraction

Subtracting Fractions with Same Denominator

Since both fractions share the denominator 6:

- Subtract the numerators:
- $40 - 21 = 19$
- Keep the denominator unchanged:
- 6

Result:

$$19/6$$

Converting Back to a Mixed Number

The fractional result $19/6$ can be expressed as a mixed number:

1. Divide numerator by denominator:
 - $19 \div 6 = 3$ with a remainder of 1.
2. Write as:
 - $3 \frac{1}{6}$

Therefore, the final answer to $6 \frac{2}{3} - 21/6$ is $3 \frac{1}{6}$.

Summary of the Solution Process

Step	Action	Result
1	Convert mixed number to improper fraction	$6 \frac{2}{3} = \frac{20}{3}$
2	Convert to common denominator with $\frac{21}{6}$	$\frac{20}{3} = \frac{40}{6}$
3	Subtract the fractions	$\frac{40}{6} - \frac{21}{6} = \frac{19}{6}$
4	Convert improper fraction back to mixed number	$\frac{19}{6} = 3 \frac{1}{6}$

Features and Benefits of the Method Used

Pros:

- Consistency: Converting all fractions to improper fractions ensures uniformity in calculations.
- Simplicity: Using common denominators simplifies the subtraction process.
- Clarity: Breaking the problem into steps fosters better understanding and reduces errors.
- Versatility: The method applies to a wide range of fractional operations, not just subtraction.

Cons:

- Initial learning curve: Understanding conversions between mixed and improper fractions can be challenging for beginners.
- Extra steps: Conversions can seem cumbersome without practice.
- Potential for errors: Mistakes in numerator or denominator calculations during conversions can lead to incorrect answers.

Common Mistakes to Avoid

- Incorrect conversion of mixed numbers: Always multiply the whole number by the denominator, then add the numerator.
- Mismatched denominators: Failing to find the least common denominator or converting fractions properly.
- Ignoring the sign of the result: Ensure subtraction is performed correctly, especially when the second fraction is larger.
- Forgetting to simplify the final answer: Always convert improper fractions to mixed numbers if needed.

Additional Tips for Mastery

- Practice converting between mixed numbers and improper fractions regularly.
- Always write down intermediate steps to track your work.
- Use visual aids like fraction bars or circles to better grasp the concepts.
- Double-check your conversions and calculations to minimize errors.
- Explore similar problems to reinforce the method and build confidence.

Conclusion

Solving $6\frac{2}{3} - 2\frac{1}{6}$ might initially seem intimidating, but by systematically converting mixed numbers to improper fractions, finding common denominators, performing straightforward subtraction, and then converting back to a mixed number, the process becomes manageable and logical. This approach not only provides the correct answer, $3\frac{1}{6}$, but also reinforces fundamental fraction skills crucial for more advanced mathematics. With practice, these steps become intuitive, enabling learners to tackle a wide array of fractional problems with confidence. Remember, mastering fractions is a stepping stone to broader mathematical understanding and problem-solving prowess.

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