How Do I Solve 6 8/9 - 5 2/3?

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Are you struggling to understand how to subtract mixed numbers like 6 8/9 and 5 2/3? You're not alone! Many students and learners find mixed number subtraction challenging at first. In this comprehensive guide, we will walk you through the step-by-step process of subtracting these mixed numbers, ensuring you grasp the concept thoroughly and can solve similar problems with confidence. Whether you're preparing for a math test or just want to improve your math skills, this article will provide clear explanations, useful tips, and practice strategies to master solving 6 8/9 - 5 2/3.

Understanding Mixed Numbers and Subtraction

Before diving into the specific problem, it’s essential to understand what mixed numbers are and how subtraction works with them.

What Are Mixed Numbers?

Mixed numbers combine a whole number and a proper fraction. For example:
- 6 8/9 (which means 6 plus 8/9)
- 5 2/3 (which means 5 plus 2/3)

They are useful for representing quantities that are not whole numbers, such as measurements, weights, or parts of a whole.

Why Is Subtracting Mixed Numbers Sometimes Tricky?

The challenge arises because:
- The fractions may have different denominators.
- You may need to borrow from the whole number if the fractional part of the minuend (the number being subtracted from) is smaller than that of the subtrahend (the number being subtracted).

Understanding how to handle these issues is key to solving mixed number subtraction problems successfully.

Step-by-Step Guide to Solving 6 8/9 - 5 2/3

Let's walk through the problem step-by-step:

Problem: 6 8/9 - 5 2/3

Step 1: Convert Mixed Numbers to Improper Fractions

Converting mixed numbers into improper fractions makes subtraction easier.

- For 6 8/9:
1. Multiply the whole number (6) by the denominator (9): 6 × 9 = 54
2. Add the numerator (8): 54 + 8 = 62
3. Place over the original denominator: 62/9

- For 5 2/3:
1. Multiply the whole number (5) by the denominator (3): 5 × 3 = 15
2. Add the numerator (2): 15 + 2 = 17
3. Place over the original denominator: 17/3

Now the problem becomes:
$$
\frac{62}{9} - \frac{17}{3}
$$

Finding a Common Denominator

To subtract these fractions, they must have the same denominator.

Step 2: Find the Least Common Denominator (LCD)

- Denominators are 9 and 3.
- The LCD of 9 and 3 is 9 because 9 is divisible by 3.

Step 3: Convert Fractions to Equivalent Fractions with the LCD

- The second fraction, 17/3, needs to be converted to denominator 9:
- Multiply numerator and denominator by 3:
$$
\frac{17 \times 3}{3 \times 3} = \frac{51}{9}
$$

Now, the problem is:
$$
\frac{62}{9} - \frac{51}{9}
$$

Subtracting the Fractions

Since denominators are the same, subtract the numerators:
$$
62/9 - 51/9 = (62 - 51)/9 = 11/9
$$

The result, 11/9, is an improper fraction, which can be converted back to a mixed number.

Convert the Improper Fraction Back to a Mixed Number

- Divide numerator by denominator:
$$
11 \div 9 = 1 \text{ with a remainder of } 2
$$

- Write as a mixed number:
$$
1 \frac{2}{9}
$$

Step 4: Adjust the Whole Number Part

Recall the original whole numbers:
- The first mixed number was 6 8/9
- The second was 5 2/3 (which we converted to improper fraction earlier)

Since the fractional part resulted in 1 2/9 after subtraction, you need to check if any adjustment is necessary to the whole number part.

Note: Because we only subtracted the fractional parts, the whole number part remains:

$$
6 - 5 = 1
$$

But wait! We need to verify if we need to do any borrowing when performing the subtraction of the mixed numbers directly.

Alternative Method: Borrowing When Necessary

Sometimes, it's easier to subtract mixed numbers directly by borrowing if the fractional part of the top number is smaller than that of the bottom.

In our problem:
- Fractional part of 6 8/9 is 8/9
- Fractional part of 5 2/3 is 2/3 (which is 6/9 when converted)

Since 8/9 is greater than 2/3 (which is 6/9), we can subtract directly without borrowing.

But, if the fractional part of the top number was smaller, we would need to borrow 1 from the whole number part.

Final Answer and Explanation

After performing the subtraction, the result is:

1 2/9

This means:
\[
6 8/9 - 5 2/3 = 1 \frac{2}{9}
\]

Summary of the Steps to Solve Mixed Number Subtraction

1. Convert mixed numbers to improper fractions.
2. Find the least common denominator (LCD).
3. Convert fractions to equivalent fractions with the LCD.
4. Subtract the numerators.
5. Simplify the result if necessary.
6. Convert the improper fraction back to a mixed number.
7. Adjust the whole number part if borrowing was needed.

Additional Tips for Solving Similar Problems

- Always check if borrowing is necessary before subtracting.
- Simplify fractions when possible.
- Practice converting between mixed numbers and improper fractions regularly.
- Keep the denominators consistent to make subtraction straightforward.
- Use visual aids like number lines or pie charts for better understanding.

Practice Problems to Enhance Your Skills

Try solving these problems using the steps outlined:

1. 7 3/4 - 4 1/2
2. 9 5/6 - 2 2/3
3. 5 7/8 - 3 2/5
4. 8 2/3 - 6 4/9

By practicing these, you'll improve your ability to handle various mixed number subtraction problems confidently.

Conclusion

Solving 6 8/9 - 5 2/3 might seem complicated at first, but breaking it down into manageable steps makes the process much easier. Converting mixed numbers to improper fractions simplifies the subtraction, and understanding how to find common denominators is crucial. Remember to convert back to mixed numbers after subtracting fractions, and don’t forget to check if borrowing is necessary. With consistent practice and clear understanding of each step, you'll master mixed number subtraction and enhance your overall math skills.

If you follow these detailed instructions and tips, you'll confidently solve similar problems in the future. Happy solving!

Frequently Asked Questions

How do I subtract mixed numbers like 6 8/9 and 5 2/3?

First, convert both mixed numbers to improper fractions, find a common denominator, subtract the fractions, and then simplify if needed. Finally, convert back to a mixed number if desired.

What is the first step to solve 6 8/9 - 5 2/3?

The first step is to convert both mixed numbers to improper fractions: 6 8/9 becomes 62/9, and 5 2/3 becomes 17/3.

How do I find a common denominator for 9 and 3?

The least common denominator (LCD) for 9 and 3 is 9, since 9 is a multiple of 3.

How do I convert 17/3 to have the denominator 9?

Multiply numerator and denominator by 3: 17/3 = (17×3)/(3×3) = 51/9.

What is the equivalent improper fraction for 62/9?

62/9 is already in improper fraction form; it represents the mixed number 6 8/9.

How do I subtract 62/9 and 51/9?

Subtract the numerators: 62 - 51 = 11, so the difference is 11/9.

What is 11/9 as a mixed number?

11/9 = 1 2/9, since 11 divided by 9 is 1 with a remainder of 2.

What is the final answer to 6 8/9 - 5 2/3?

The result is 1 2/9.

Can I check my answer by adding 5 2/3 and 1 2/9?

Yes, adding 5 2/3 and 1 2/9 should give you back 6 8/9, confirming your subtraction answer is correct.

Are there any tips for subtracting mixed numbers with different denominators?

Yes, always convert to improper fractions, find a common denominator, perform the subtraction, and then simplify or convert back to a mixed number if needed.

Additional Resources

How Do I Solve 6 8/9 - 5 2/3?

Mathematics is often viewed as a language of logic and precision, yet even seemingly straightforward problems can sometimes pose a challenge—especially when they involve mixed numbers and fractions. A common question among students and educators alike is: How do I solve 6

8/9 - 5 2/3? While on the surface it appears simple, the process involves a series of steps that require careful attention to detail. This article aims to dissect this problem thoroughly, exploring the techniques, strategies, and common pitfalls associated with subtracting mixed numbers.

Understanding the Problem: Breaking Down the Expression

Before diving into calculations, it's essential to understand what the problem entails:

- Mixed Numbers: These are numbers composed of a whole number and a fractional part. In this case:
- 6 8/9 (six and eight ninths)
- 5 2/3 (five and two thirds)

- Objective: Subtract 5 2/3 from 6 8/9.

Step 1: Convert Mixed Numbers to Improper Fractions

The initial step in solving such problems is often to convert mixed numbers into improper fractions. This simplifies the subtraction process by working with fractions alone.

How to Convert Mixed Numbers to Improper Fractions

For any mixed number $a\,b/c$:
$$
\text{Improper Fraction} = \left(\text{Whole Number} \times \text{Denominator} \right) + \text{Numerator} \quad / \quad \text{Denominator}
$$

Applying this to our numbers:

For 6 8/9:
$$
6 \frac{8}{9} = \left(6 \times 9\right) + 8 = 54 + 8 = 62/9
$$

For 5 2/3:
$$
5 \frac{2}{3} = \left(5 \times 3\right) + 2 = 15 + 2 = 17/3
$$

Now, the problem transforms into:

$$
\frac{62}{9} - \frac{17}{3}
$$

Step 2: Find a Common Denominator

Subtracting fractions requires a common denominator. Here, the denominators are 9 and 3.

Least Common Denominator (LCD):

- The least common multiple (LCM) of 9 and 3 is 9.

- Since 3 divides evenly into 9, 9 is our LCD.

Adjust fractions to have the same denominator:

- $\frac{62}{9}$ already has denominator 9.

- $\frac{17}{3}$ needs to be converted:

$$
\frac{17}{3} = \frac{17 \times 3}{3 \times 3} = \frac{51}{9}
$$

Step 3: Perform the Subtraction

Now, the problem is:

$$
\frac{62}{9} - \frac{51}{9}
$$

Subtract numerators:

$$
62 - 51 = 11
$$

So,

$$
\frac{11}{9}
$$

This is an improper fraction, which can be expressed as a mixed number.

Step 4: Convert Back to a Mixed Number

Divide numerator by denominator:

\[

$$
11 \div 9 = 1 \text{ with a remainder of } 2
$$

Expressed as a mixed number:

$$
1 \frac{2}{9}
$$

Step 5: Final Result and Interpretation

Thus, the value of 6 8/9 - 5 2/3 equals 1 2/9.

Additional Considerations: Handling Different Denominators and Simplifications

While in this specific example the denominators were easily manageable, more complex problems might involve fractions with different denominators that are not multiples of each other. Here are some tips and strategies:

1. Finding the Least Common Denominator (LCD)
- List the prime factors of each denominator.
- Take the highest power of each prime factor.
- Multiply these together to find the LCD.

2. Simplifying Fractions
- After subtracting, check if the resulting fraction can be simplified.
- Divide numerator and denominator by their greatest common divisor (GCD).

3. Converting Improper Fractions to Mixed Numbers
- Use division to determine the whole number part.
- The remainder over the original denominator forms the fractional part.

Common Mistakes and How to Avoid Them

Mistake 1: Forgetting to Convert Mixed Numbers to Improper Fractions
- Always convert first to facilitate easier subtraction.

Mistake 2: Not Finding a Common Denominator
- Working with different denominators without proper adjustment leads to incorrect results.

Mistake 3: Incorrect Arithmetic with Fractions
- Carefully perform numerator subtraction, especially when borrowing is necessary.

Mistake 4: Forgetting to Simplify
- Always check if the resulting fraction can be reduced.

Mistake 5: Confusing the Signs
- Ensure the subtraction operation is correctly applied, especially when dealing with negative results or more complex expressions.

Practical Applications and Tips for Learners

- Practice with varied problems: To master the process, work through problems with different denominators and mixed numbers.
- Use visual aids: Pie charts or number lines can help conceptualize the subtraction.
- Check your work: Convert your final answer back into a mixed number and verify by adding it to the subtrahend to see if you recover the minuend.

Summary of the Step-by-Step Solution

Step	Action	Result
1	Convert mixed numbers to improper fractions	$6\ 8/9 = 62/9$, $5\ 2/3 = 17/3$
2	Find common denominator (LCD = 9)	$17/3 = 51/9$
3	Subtract fractions	$62/9 - 51/9 = 11/9$
4	Convert improper fraction to mixed number	$11/9 = 1 \frac{2}{9}$
5	Final answer	1 2/9

Conclusion

The process of solving 6 8/9 - 5 2/3 exemplifies the systematic approach necessary for handling mixed numbers and fractions. Converting to improper fractions simplifies the arithmetic, finding the common denominator ensures accuracy, and converting back to a mixed number provides an easily interpretable result. Through careful step-by-step execution and awareness of common pitfalls, learners can confidently tackle similar problems, enhancing their understanding of fractional subtraction and mixed number operations.

The key takeaway is that understanding the foundational steps—conversion, common denominators, arithmetic, and simplification—empowers students to solve a wide range of fractional problems with clarity and precision.

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