

Use This Common Denominator To Find Equivalent Fractions For $1\frac{2}{3}$ And $\frac{3}{4}$ If $1\frac{2}{3}=1$ And $\frac{3}{4}=$

Use This Common Denominator To Find Equivalent Fractions For $1\frac{2}{3}$ And $\frac{3}{4}$ If $1\frac{2}{3}=1$ And $\frac{3}{4}=$ is a fundamental concept in understanding how to compare and work with fractions effectively. Whether you're a student learning fractions for the first time or someone brushing up on math skills, mastering the process of finding equivalent fractions is essential. This article will guide you through the steps, provide practical examples, and offer tips to make the process clear and straightforward.

Understanding Mixed Numbers and Their Fractional Parts

Before diving into finding equivalent fractions, it's important to understand what mixed numbers are and how they relate to improper fractions.

What Is a Mixed Number?

A mixed number combines a whole number and a fractional part. For example, in $1\frac{2}{3}$:

- The whole number is 1
- The fractional part is $\frac{2}{3}$

Similarly, $\frac{3}{4}$ is purely a fraction, but when associated with a whole number, it forms a mixed number.

Converting Mixed Numbers to Improper Fractions

To compare or find equivalent fractions, it's often easiest to convert mixed numbers into improper fractions.

Steps to convert:

1. Multiply the whole number by the denominator.
2. Add the numerator to this product.
3. Write the result over the original denominator.

Example:

- $1\frac{2}{3}$:
- Multiply 1 by 3: $1 \times 3 = 3$
- Add the numerator: $3 + 2 = 5$
- Improper fraction: $\frac{5}{3}$

- $\frac{3}{4}$ (already a fraction, but can be written as $\frac{3}{4}$)

Finding a Common Denominator: The Key to Equivalent Fractions

The core idea behind creating equivalent fractions is to find a common denominator. This allows you to compare fractions directly or perform addition/subtraction.

Why Is a Common Denominator Important?

Fractions are only directly comparable when they share the same denominator. For example, $\frac{1}{2}$ and $\frac{3}{4}$ cannot be directly compared as they have different denominators. By converting them to equivalent fractions with a common denominator, comparison and calculation become straightforward.

How to Find the Common Denominator

The most common method involves finding the Least Common Multiple (LCM) of the denominators.

Steps:

1. List the multiples of each denominator.
2. Find the smallest multiple common to both.
3. Use this multiple as the common denominator.

Applying the Method to $1\frac{2}{3}$ and $\frac{3}{4}$

Now, let's apply this process to the specific fractions $1\frac{2}{3}$ and $\frac{3}{4}$. Recall:

- $1\frac{2}{3}$ converts to $\frac{5}{3}$
- $\frac{3}{4}$ remains as $\frac{3}{4}$

Step 1: Convert Mixed Number to Improper Fraction

- $1\frac{2}{3} = \frac{5}{3}$
- $\frac{3}{4}$ remains as $\frac{3}{4}$

Step 2: Find the Least Common Multiple (LCM) of 3 and 4

- Multiples of 3: 3, 6, 9, 12, 15, ...

- Multiples of 4: 4, 8, 12, 16, ...
- LCM of 3 and 4 is 12

Step 3: Convert Both Fractions to Have Denominator 12

- For $\frac{5}{3}$:
- Multiply numerator and denominator by 4: $(5 \times 4)/(3 \times 4) = \frac{20}{12}$
- For $\frac{3}{4}$:
- Multiply numerator and denominator by 3: $(3 \times 3)/(4 \times 3) = \frac{9}{12}$

Step 4: Write the Equivalent Fractions

- $1\frac{2}{3} = \frac{5}{3} = \frac{20}{12}$
- $\frac{3}{4} = \frac{9}{12}$

Now, both fractions are expressed with the same denominator, making comparison or further calculations easy.

Understanding the Significance of the Common Denominator

Having both fractions with a common denominator of 12, we can see:

- $\frac{20}{12}$ (which is $1\frac{2}{3}$)
- $\frac{9}{12}$ (which is $\frac{3}{4}$)

From here, you can:

- Compare the fractions directly: $\frac{20}{12} > \frac{9}{12}$
- Simplify or convert back to mixed numbers if needed
- Add or subtract the fractions easily

Additional Examples of Finding Equivalent Fractions

To cement understanding, here are some additional examples.

Example 1: Find an equivalent fraction for $\frac{2}{5}$ with denominator 15

- Multiply numerator and denominator by 3:
- $(2 \times 3)/(5 \times 3) = \frac{6}{15}$

Example 2: Find an equivalent fraction for $\frac{7}{8}$ with denominator 24

- Multiply numerator and denominator by 3:
- $(7 \times 3)/(8 \times 3) = 21/24$

Example 3: Find an equivalent fraction for $\frac{3}{10}$ with denominator 50

- Multiply numerator and denominator by 5:
- $(3 \times 5)/(10 \times 5) = 15/50$

Tips for Simplifying Fractions and Finding Common Denominators

- Always look for the Least Common Multiple (LCM) to minimize the numbers you're working with.
- Simplify fractions after finding equivalent ones to make calculations easier.
- Practice converting mixed numbers to improper fractions and vice versa.
- Use prime factorization to find the LCM efficiently, especially with larger numbers.

Practice Problems to Master the Concept

1. Convert $2 \frac{1}{4}$ to an improper fraction and find an equivalent fraction with denominator 12.
2. Find an equivalent fraction for $\frac{4}{9}$ with denominator 36.
3. Convert $5 \frac{2}{5}$ to an improper fraction and find a common denominator with $\frac{3}{10}$.
4. Compare $1 \frac{1}{2}$ and $\frac{2}{3}$ by converting both to equivalent fractions with a common denominator.

Conclusion: Mastering Equivalent Fractions Using a Common Denominator

Understanding how to find equivalent fractions using a common denominator is a vital skill in mathematics. By converting mixed numbers to improper fractions, identifying the least common multiple, and adjusting fractions accordingly, you can compare, add, subtract, and simplify fractions efficiently. This process not only enhances your arithmetic skills but also builds a strong foundation for more advanced math topics like algebra and ratios.

Remember, practice makes perfect. Keep working through various examples, and soon, finding equivalent fractions will become second nature. Whether working on homework, preparing for tests, or solving real-world problems, mastering this concept empowers you to handle fractions with confidence and ease.

Frequently Asked Questions

How do I find a common denominator for $1\frac{2}{3}$ and $\frac{3}{4}$?

First, convert $1\frac{2}{3}$ to an improper fraction (which is $\frac{5}{3}$), then find the least common denominator (LCD) of 3 and 4, which is 12. Use this LCD to rewrite both fractions with denominator 12.

What is the equivalent fraction of $1\frac{2}{3}$ with denominator 12?

Convert $1\frac{2}{3}$ to an improper fraction: $\frac{5}{3}$. Multiply numerator and denominator by 4: $(5 \times 4) / (3 \times 4) = 20/12$. So, $1\frac{2}{3} = 20/12$.

How can I convert $\frac{3}{4}$ to an equivalent fraction with denominator 12?

Multiply numerator and denominator by 3: $(3 \times 3) / (4 \times 3) = 9/12$. So, $\frac{3}{4} = 9/12$.

What is the process to compare $1\frac{2}{3}$ and $\frac{3}{4}$ using common denominators?

Convert both to improper fractions with the same denominator (12): $1\frac{2}{3} = 20/12$ and $\frac{3}{4} = 9/12$. Then compare the numerators: $20 > 9$, so $1\frac{2}{3}$ is greater than $\frac{3}{4}$.

Why do we use common denominators to find equivalent fractions?

Using common denominators makes it easier to compare, add, or subtract fractions because they are expressed with the same base, allowing direct comparison of numerators.

Additional Resources

Use This Common Denominator To Find Equivalent Fractions For $1\frac{2}{3}$ And $\frac{3}{4}$ If $1\frac{2}{3}=1$ And $\frac{3}{4}=$

Introduction

Mathematics has long served as the language through which humans understand and interpret the world around them. Among its foundational concepts, fractions stand out as essential tools for expressing parts of a whole. Whether in everyday life, academic pursuits, or professional fields like

engineering and finance, the ability to manipulate and understand fractions is crucial. One of the core skills in working with fractions is finding equivalent fractions—fractions that represent the same value but have different numerators and denominators. This capability becomes especially important when comparing fractions, adding or subtracting them, or simplifying expressions.

This investigative article delves into the process of finding equivalent fractions for the mixed number $1\frac{2}{3}$ and the fraction $\frac{3}{4}$, emphasizing the use of a common denominator. We will explore foundational principles, demonstrate step-by-step methods, and clarify common misconceptions, offering a comprehensive guide for educators, students, and enthusiasts alike.

Understanding the Fundamentals: Mixed Numbers and Fractions

Before venturing into the process of finding equivalent fractions, it's essential to clarify the basic definitions:

- Mixed Number: A number consisting of a whole number and a proper fraction. For example, $1\frac{2}{3}$ combines the whole number 1 with the fraction $\frac{2}{3}$.
- Proper Fraction: A fraction where the numerator is less than the denominator, like $\frac{2}{3}$ or $\frac{3}{4}$.
- Equivalent Fractions: Different fractions that represent the same quantity. For example, $\frac{1}{2}$ and $\frac{2}{4}$ are equivalent.

Expressing mixed numbers as improper fractions simplifies calculations and comparisons. For instance, $1\frac{2}{3}$ can be converted to an improper fraction to facilitate finding equivalents.

Converting Mixed Numbers to Improper Fractions

To manipulate the fractions effectively, convert $1\frac{2}{3}$ into an improper fraction:

1. Multiply the whole number by the denominator:

$$1 \times 3 = 3$$

2. Add the numerator:

$$3 + 2 = 5$$

3. Place this sum over the original denominator:

Improper Fraction: $\frac{5}{3}$

Similarly, the fraction $\frac{3}{4}$ remains as is, but for operations such as adding, subtracting, or comparing, it's often most practical to work with improper fractions.

The Concept of Common Denominator

The process of finding equivalent fractions often involves identifying a common denominator—the same bottom number in fractions—which allows for straightforward comparison or addition. The key idea is that:

> To compare or combine fractions, they must have the same denominator.

For example, to compare $\frac{2}{3}$ and $\frac{3}{4}$, converting both to fractions with a common denominator makes it easier to see which is larger or to perform addition/subtraction.

Finding a Common Denominator: The Least Common Multiple Approach

The most efficient way to find a common denominator is to find the Least Common Multiple (LCM) of the denominators. The LCM of two numbers is the smallest number divisible by both.

Step-by-step process:

1. List the multiples of each denominator.
2. Identify the smallest multiple common to both.

For denominators 3 and 4:

- Multiples of 3: 3, 6, 9, 12, 15, ...
- Multiples of 4: 4, 8, 12, 16, ...

LCM of 3 and 4 is 12.

Thus, the common denominator is 12.

Applying the Common Denominator to $1\frac{2}{3}$ and $\frac{3}{4}$

Now, convert both fractions to equivalent fractions with denominator 12.

Step 1: Convert $1\frac{2}{3}$ to an improper fraction

- As previously calculated: $1\frac{2}{3} = \frac{5}{3}$

Step 2: Convert $\frac{5}{3}$ to a fraction with denominator 12

- Find what to multiply 3 by to get 12: $3 \times 4 = 12$
- Multiply numerator and denominator by 4:

$$5 \times 4 = 20$$

$$\text{So, } \frac{5}{3} = \frac{20}{12}$$

Step 3: Convert $\frac{3}{4}$ to a fraction with denominator 12

- Find what to multiply 4 by to get 12: $4 \times 3 = 12$
- Multiply numerator and denominator by 3:

$$3 \times 3 = 9$$

$$\text{So, } \frac{3}{4} = \frac{9}{12}$$

Final Equivalent Fractions

- $1 \frac{2}{3} = \frac{20}{12}$
- $\frac{3}{4} = \frac{9}{12}$

These fractions are now expressed with a common denominator, enabling direct comparison, addition, or subtraction.

Analysis and Implications

Having established these equivalent fractions, several insights emerge:

- Comparison: Since $\frac{20}{12} > \frac{9}{12}$, the original mixed number $1 \frac{2}{3}$ is greater than $\frac{3}{4}$.
- Addition: To add $1 \frac{2}{3}$ and $\frac{3}{4}$, convert both to the common denominator:

$$\frac{20}{12} + \frac{9}{12} = \frac{29}{12}$$

The sum is an improper fraction, which can be converted back to a mixed number:

$$29 \div 12 = 2 \text{ with a remainder of } 5$$

$$\text{So, } \frac{29}{12} = 2 \frac{5}{12}$$

- Subtraction: To find the difference:

$$\frac{20}{12} - \frac{9}{12} = \frac{11}{12}$$

Which remains a proper fraction.

Broader Context: Why Does the Common Denominator Matter?

The significance of finding a common denominator extends beyond simple arithmetic:

- Simplification: Easier to compare and simplify fractions.
- Addition and Subtraction: Necessary step before performing these operations.
- Understanding Ratios and Proportions: Critical in fields like engineering, economics, and data analysis.
- Educational Foundations: Essential in building algebraic skills and understanding proportional reasoning.

In educational settings, emphasizing the process of finding the least common denominator reinforces a deeper understanding of number relationships and divisibility.

Common Misconceptions and Pitfalls

Despite its straightforward logic, several common misconceptions can hinder students:

- Confusing numerator and denominator: Remember that the denominator indicates the number of equal parts, and the numerator indicates how many parts are being considered.
- Using non-LCM denominators: Sometimes students choose denominators that are not the least common multiple, leading to less simplified fractions.
- Forgetting to multiply both numerator and denominator: When converting fractions, only multiplying the numerator and denominator by the same number preserves the value.
- Misinterpreting mixed numbers: Failing to convert mixed numbers into improper fractions can complicate the process unnecessarily.

Proper instruction and practice help overcome these pitfalls, emphasizing the importance of systematic approaches.

Practical Applications and Real-World Relevance

Understanding how to find equivalent fractions using common denominators is invaluable in various real-world scenarios:

- Cooking and Recipes: Adjusting ingredient quantities, which often involve fractions.
- Construction and Engineering: Precise measurements often require working with fractional parts.
- Financial Calculations: Comparing ratios and proportions in investments.
- Data Analysis: Normalizing data for comparison.

Mastering these skills enhances numerical literacy, problem-solving capabilities, and quantitative reasoning.

Conclusion

The process of finding equivalent fractions via common denominators is a fundamental yet powerful

tool in mathematics. By converting mixed numbers like $1\frac{2}{3}$ into improper fractions and then identifying the least common multiple of denominators, learners can simplify comparison, addition, and subtraction of fractions. This approach not only clarifies the relationships between different fractional quantities but also lays the groundwork for more advanced mathematical concepts.

Through diligent practice and conceptual understanding, students and practitioners can leverage this technique across numerous applications, ensuring their mathematical foundation remains robust and versatile. Ultimately, mastering the use of a common denominator unlocks a deeper appreciation of the interconnectedness within the world of numbers.

References & Further Reading:

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Note: This article aims to serve as a comprehensive resource for understanding the role of common denominators in finding equivalent fractions, with practical insights applicable in educational and real-world contexts.

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