

Question 1 Of 7 Find The Total Weight Of Three Items That Weigh: $5 \frac{3}{4}$ Kg, $3 \frac{1}{5}$ kg, And $7 \frac{3}{5}$

Question 1 Of 7 Find The Total Weight Of Three Items That Weigh: $5 \frac{3}{4}$ Kg, $3 \frac{1}{5}$ kg, And $7 \frac{3}{5}$ is a common problem involving the addition of mixed numbers. Understanding how to accurately add mixed numbers is an essential mathematical skill, especially when dealing with measurements like weight, length, or volume. In this article, we will explore step-by-step methods to find the total weight of these three items, providing clear explanations and examples to enhance your understanding of adding mixed numbers. Whether you're a student practicing basic arithmetic or someone looking to improve your measurement calculations, this guide will help you master the process.

Understanding the Problem

Breaking Down the Question

The question asks you to find the combined weight of three items, each measured in kilograms with mixed number weights:

- Item 1: $5 \frac{3}{4}$ Kg
- Item 2: $3 \frac{1}{5}$ Kg
- Item 3: $7 \frac{3}{5}$ Kg

The challenge lies in adding these mixed numbers accurately, which involves converting mixed numbers into improper fractions or decimals for easier calculation.

Converting Mixed Numbers to Improper Fractions

Why Convert to Improper Fractions?

Adding mixed numbers directly can be cumbersome. Converting them into improper fractions simplifies the process because fractions can be added directly once they have a common denominator.

Step-by-Step Conversion

Let's convert each mixed number:

1. $5 \frac{3}{4}$ Kg:

- Multiply the whole number by the denominator: $5 \times 4 = 20$
- Add the numerator: $20 + 3 = 23$
- Write as an improper fraction: $\frac{23}{4}$

2. $3 \frac{1}{5}$ Kg:

- $3 \times 5 = 15$
- $15 + 1 = 16$
- Improper fraction: $\frac{16}{5}$

3. $7 \frac{3}{5}$ Kg:

- $7 \times 5 = 35$
- $35 + 3 = 38$
- Improper fraction: $\frac{38}{5}$

Finding a Common Denominator

Why is a Common Denominator Necessary?

Adding fractions requires the denominators to be the same. The denominators here are 4, 5, and 5, so we need to find their least common multiple (LCM).

Calculating the Least Common Multiple (LCM)

The denominators are 4 and 5:

- Multiples of 4: 4, 8, 12, 16, 20, 24, ...
- Multiples of 5: 5, 10, 15, 20, 25, ...

The LCM of 4 and 5 is 20.

Since the fractions for the first and the third item are already over 5, we need to convert all fractions to have denominator 20.

Converting Fractions to Have a Common Denominator

Adjusting Each Fraction

1. $\frac{23}{4}$:

- Since $4 \times 5 = 20$, multiply numerator and denominator by 5:
- $23 \times 5 = 115$
- Converted fraction: $\frac{115}{20}$

2. $\frac{16}{5}$:

- Since $5 \times 4 = 20$, multiply numerator and denominator by 4:
- $16 \times 4 = 64$
- Converted fraction: $\frac{64}{20}$

3. $\frac{38}{5}$:

- Similarly, $38 \times 4 = 152$
- Converted fraction: $\frac{152}{20}$

Adding the Fractions

Sum of the Fractions

Now, add the numerators while keeping the denominator the same:

- $115/20 + 64/20 + 152/20 = (115 + 64 + 152)/20$
- Sum of numerators: $115 + 64 = 179$; $179 + 152 = 331$
- Result: $331/20$

Converting the Improper Fraction Back to a Mixed Number

Divide the Numerator by the Denominator

Perform division to convert back:

1. Divide 331 by 20:
2. $20 \times 16 = 320$
3. Remaining: $331 - 320 = 11$
4. This gives the mixed number: $16 \frac{11}{20}$ Kg

Therefore, the total weight of the three items is $16 \frac{11}{20}$ Kg.

Using Decimals for Easier Calculation

Alternative Method: Converting Mixed Numbers to Decimals

Instead of fractions, you can convert each mixed number to decimal form:

- $5 \frac{3}{4}$ Kg = $5 + 0.75 = 5.75$ Kg
- $3 \frac{1}{5}$ Kg = $3 + 0.2 = 3.2$ Kg
- $7 \frac{3}{5}$ Kg = $7 + 0.6 = 7.6$ Kg

Adding these decimals:

- $5.75 + 3.2 + 7.6 = 16.55 \text{ Kg}$

This method yields a total weight of 16.55 Kg, which is equivalent to $16 \frac{11}{20}$ Kg when expressed as a mixed number.

Summary and Final Answer

To find the total weight of the items weighing $5 \frac{3}{4}$ Kg, $3 \frac{1}{5}$ Kg, and $7 \frac{3}{5}$ Kg, converting mixed numbers into improper fractions or decimals is essential. Both methods lead to the same result:

- **Mixed Number Result:** $16 \frac{11}{20}$ Kg
- **Decimal Result:** 16.55 Kg

Thus, the combined weight of the three items is approximately 16.55 Kg.

Tips for Adding Mixed Numbers and Fractions

- Always convert mixed numbers into improper fractions for easier addition.
- Find the least common denominator to combine fractions accurately.
- Convert improper fractions back into mixed numbers for easier interpretation.
- Alternatively, use decimals for quick calculations, especially when precision is not critical.

Conclusion

Adding mixed numbers like $5 \frac{3}{4}$ Kg, $3 \frac{1}{5}$ Kg, and $7 \frac{3}{5}$ Kg is straightforward once you understand the process of converting to improper fractions or decimals. By following the step-by-step method outlined above, you can accurately determine the total weight of multiple items in measurement problems. This skill is valuable not only in academics but also in everyday situations involving measurements and calculations.

Whether you're preparing for exams, solving real-world problems, or enhancing your mathematical proficiency, mastering the addition of mixed numbers and fractions is an essential part of your mathematical toolkit. Remember to always verify your calculations and choose the method (fractions

or decimals) that best suits your needs for clarity and accuracy.

Frequently Asked Questions

How do I add mixed numbers like $5 \frac{3}{4}$ kg, $3 \frac{1}{5}$ kg, and $7 \frac{3}{5}$ kg?

Convert each mixed number to an improper fraction, find a common denominator, add the fractions, and then simplify if needed. Finally, add the whole numbers separately and combine with the fraction sum.

What is the first step to find the total weight of these items?

Convert each mixed number to an improper fraction to make addition easier.

How do I convert $5 \frac{3}{4}$ kg to an improper fraction?

Multiply the whole number 5 by the denominator 4, then add the numerator 3: $(5 \times 4) + 3 = 23$. So, $5 \frac{3}{4} = \frac{23}{4}$.

What is the sum of the improper fractions $\frac{23}{4}$, $\frac{16}{5}$, and $\frac{43}{5}$?

First, find a common denominator, which is 20. Convert each fraction: $\frac{23}{4} = \frac{115}{20}$, $\frac{16}{5} = \frac{64}{20}$, and $\frac{43}{5} = \frac{172}{20}$. Add: $\frac{115}{20} + \frac{64}{20} + \frac{172}{20} = \frac{(115+64+172)}{20} = \frac{351}{20}$.

How do I convert $\frac{351}{20}$ back to a mixed number?

Divide 351 by 20: 20 goes into 351 17 times with a remainder of 11. So, $\frac{351}{20} = 17 \frac{11}{20}$.

What is the total weight of the three items in mixed number form?

Adding the whole numbers and the fractional parts: $5 \frac{3}{4} + 3 \frac{1}{5} + 7 \frac{3}{5} = 15 \frac{11}{20}$ Kg.

What is the final answer for the total weight of the three items?

The total weight is $15 \frac{11}{20}$ kilograms.

Can I use a calculator to verify this addition?

Yes, converting all mixed numbers to decimals or improper fractions and summing them with a calculator can help verify your result.

Why is it important to find a common denominator when adding mixed numbers?

Finding a common denominator allows you to accurately add fractions since they need to be expressed with the same base for correct addition.

Additional Resources

Question 1 Of 7 Find The Total Weight Of Three Items That Weigh: $5\frac{3}{4}$ Kg, $3\frac{1}{5}$ Kg, And $7\frac{3}{5}$ Kg

In everyday life, we often encounter situations requiring us to combine weights or measurements—be it in cooking, shipping, or scientific experiments. The problem at hand involves calculating the total weight of three items, each given in mixed fractions: $5\frac{3}{4}$ kg, $3\frac{1}{5}$ kg, and $7\frac{3}{5}$ kg. While seemingly straightforward, adding mixed fractions presents a unique challenge that combines understanding of fractions, common denominators, and precise calculation. This article aims to guide readers through the process with clarity, offering insights into the underlying mathematical principles and practical steps involved.

Understanding the Problem: Breaking Down the Measurements

The problem involves three weights:

- Item 1: $5\frac{3}{4}$ kg
- Item 2: $3\frac{1}{5}$ kg
- Item 3: $7\frac{3}{5}$ kg

Each weight is expressed as a mixed number, which combines a whole number and a proper fraction. To accurately find the total weight, we need to:

1. Convert each mixed number into an improper fraction.
2. Find a common denominator for the fractions.
3. Add the fractions together.
4. Add the resulting improper fractions to the whole numbers.

This process ensures precision and clarity, particularly when dealing with real-world measurements that require exact calculations.

Step 1: Converting Mixed Numbers to Improper Fractions

Mixed numbers are easier to manipulate mathematically when expressed as improper fractions. The general formula for conversion is:

$$\text{Improper Fraction} = (\text{Whole Number} \times \text{Denominator}) + \text{Numerator} \bigg/ \text{Denominator}$$

\]

Let's apply this to each weight:

Item 1: $5 \frac{3}{4}$

- Whole number: 5
- Fractional part: $\frac{3}{4}$

Conversion:

$$\begin{aligned} & \backslash \\ 5 \times 4 + 3 &= 20 + 3 = 23 \\ & \backslash \end{aligned}$$

So,

$$\begin{aligned} & \backslash \\ 5 \frac{3}{4} &= \frac{23}{4} \\ & \backslash \end{aligned}$$

Item 2: $3 \frac{1}{5}$

- Whole number: 3
- Fractional part: $\frac{1}{5}$

Conversion:

$$\begin{aligned} & \backslash \\ 3 \times 5 + 1 &= 15 + 1 = 16 \\ & \backslash \end{aligned}$$

So,

$$\begin{aligned} & \backslash \\ 3 \frac{1}{5} &= \frac{16}{5} \\ & \backslash \end{aligned}$$

Item 3: $7 \frac{3}{5}$

- Whole number: 7
- Fractional part: $\frac{3}{5}$

Conversion:

$$\begin{aligned} & \backslash \\ 7 \times 5 + 3 &= 35 + 3 = 38 \\ & \backslash \end{aligned}$$

So,

$$\frac{7}{5} \times \frac{3}{4} = \frac{21}{20}$$

Step 2: Finding a Common Denominator

To add the fractions, they must share a common denominator. The denominators are 4, 5, and 5. The least common denominator (LCD) of 4 and 5 is 20.

- For $\frac{23}{4}$:

$$\frac{23}{4} = \frac{23 \times 5}{4 \times 5} = \frac{115}{20}$$

- For $\frac{16}{5}$:

$$\frac{16}{5} = \frac{16 \times 4}{5 \times 4} = \frac{64}{20}$$

- For $\frac{38}{5}$:

$$\frac{38}{5} = \frac{38 \times 4}{5 \times 4} = \frac{152}{20}$$

Now, all fractions are expressed with denominator 20:

- $\frac{115}{20}$

- $\frac{64}{20}$

- $\frac{152}{20}$

Step 3: Adding the Fractions

Add the fractional parts:

$$\frac{115}{20} + \frac{64}{20} + \frac{152}{20} = \frac{115 + 64 + 152}{20} = \frac{331}{20}$$

This sum is an improper fraction, which can be converted back into a mixed number for easier interpretation.

Dividing numerator by denominator:

$$331 \div 20 = 16 \text{ with a remainder of } 11$$

Therefore,

$$\frac{331}{20} = 16 \frac{11}{20}$$

Step 4: Adding the Whole Numbers

Recall the whole numbers:

- 5 (from Item 1)
- 3 (from Item 2)
- 7 (from Item 3)

Sum:

$$5 + 3 + 7 = 15$$

Now, combine the whole number sum with the fractional sum:

$$15 + 16 \frac{11}{20} = (15 + 16) + \frac{11}{20} = 31 + \frac{11}{20}$$

Expressed as a mixed number:

$$\boxed{31 \frac{11}{20} \text{ kg}}$$

Final Answer: Total Weight of the Three Items

The total weight of the three items—5 $\frac{3}{4}$ kg, 3 $\frac{1}{5}$ kg, and 7 $\frac{3}{5}$ kg—is 31 $\frac{11}{20}$ kg.

Practical Implications and Applications

Understanding how to accurately add mixed numbers is essential in various fields:

- Logistics and Shipping: Calculating total weights for packaging and freight planning.

- Cooking and Recipes: Combining ingredient measurements accurately.
- Science and Engineering: Precise measurement handling for experiments and manufacturing.

This method ensures exactness, especially when measurements are critical for safety, compliance, or quality control.

Tips for Handling Similar Problems

1. Convert all mixed numbers to improper fractions first to simplify calculations.
2. Determine the least common denominator (LCD) for all fractions involved.
3. Convert fractions to equivalent fractions with the LCD.
4. Add numerators and keep the common denominator.
5. Simplify the resulting improper fraction, then convert back to a mixed number if needed.
6. Add whole numbers separately before combining with fractional sums.

Conclusion

Adding mixed fractions might seem daunting at first, but with a structured approach, it becomes a straightforward process. By converting mixed numbers to improper fractions, finding common denominators, performing the addition, and then converting back, one can handle complex measurement problems with confidence and accuracy. The total weight of the three items, $31\frac{11}{20}$ kg, exemplifies how careful calculation ensures precise results, which are essential across many practical applications.

Final Thoughts

Whether you're a student mastering fractions or a professional dealing with measurements, understanding the principles of mixed number addition enhances your mathematical toolkit. It fosters accuracy, improves problem-solving skills, and ensures that you can confidently handle real-world measurement challenges.

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