

Addition and Subtraction of Mixed Numbers

Firas and Ghassan are going to put up a tent. They need two pieces of rope to secure the tent. One has to be $3\frac{1}{2}$ feet long and the other $2\frac{1}{4}$ feet long. How much rope do they need?

To find the answer, you must add $3\frac{1}{2} + 2\frac{1}{4}$.

You can add mixed numbers by following steps:

STEP 1

Add the whole numbers. $3 + 2 = 5$

STEP 2

Find the LCD. Write equivalent fractions. Add the fractions.

multiples of 4: $\textcircled{4}$ 8, 12, ...

$$\frac{1}{2} = \frac{1 \cdot 2}{2 \cdot 2} = \frac{2}{4}$$

multiples of 2: 2, $\textcircled{4}$, 6, ...

$$\frac{1}{4} = \frac{1 \cdot 1}{4 \cdot 1} = \frac{1}{4}$$

$$\frac{1}{2} + \frac{1}{4} = \frac{2}{4} + \frac{1}{4} = \frac{3}{4}$$

STEP 3

Add the sum of the whole numbers to the sum of fractions. Write the answer in simplest form if needed.

$$5 + \frac{3}{4} = 5\frac{3}{4}$$

$$\text{So, } 3\frac{1}{2} + 2\frac{1}{4} = 5\frac{3}{4}$$

Examples:

A- Find the sum.

$$1) \begin{array}{r} 2 \cancel{1} + 4 \cancel{1} \\ 2 \quad 4 \end{array}$$

$$\begin{array}{r} 2 + 4 \\ \hline 6 \end{array} \quad \begin{array}{r} \cancel{1} + \cancel{1} \\ 2 \quad 4 \end{array}$$

$$6 \quad \frac{2 \times 2 + 1}{4}$$

$$6 \quad \frac{4 + 1}{4}$$

$$6 \quad \frac{5}{4}$$

$$2) \begin{array}{r} 4 \cancel{2} + 5 \cancel{3} \\ 5 \quad 10 \end{array}$$

$$\begin{array}{r} 4 + 5 \\ \hline 9 \end{array} \quad \begin{array}{r} \cancel{2} + \cancel{3} \\ 5 \quad 10 \end{array}$$

$$9 \quad \frac{2 \times 2 + 3}{10}$$

$$9 \quad \frac{4 + 3}{10}$$

$$9 \quad \frac{7}{10}$$

Samia cut out a pattern for a new blouse from the $3\frac{1}{2}$ yards of material she bought. The pattern used $2\frac{1}{3}$ yards. How much materials are left?

You can answer the question by subtracting, $3\frac{1}{2} - 2\frac{1}{3}$

To subtract mixed numbers, follow these steps.

STEP 1

Find the LCD of the fractions by listing the multiples of each number.

Multiples of 2: 2, 4, 6, 8, ...

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

STEP 2

Change the fractions into like fractions with 6 as the denominator.

$$\frac{1 \times 3}{2 \times 3} = \frac{3}{6} \quad \frac{1 \times 2}{3 \times 2} = \frac{2}{6}$$

Since 6 is the first common multiple, it is the least common multiple.

STEP 3

Subtract the fractions.

$$\begin{array}{r}
 3\frac{1}{2} = 3\frac{3}{6} \\
 - 2\frac{1}{3} = 2\frac{2}{6} \\
 \hline
 \frac{1}{6}
 \end{array}$$

STEP 4

Subtract the whole numbers.

$$\begin{array}{r}
 3\frac{1}{2} = 3\frac{3}{6} \\
 - 2\frac{1}{3} = 2\frac{2}{6} \\
 \hline
 1 \frac{1}{6}
 \end{array}$$

So, Samia has $1 \frac{1}{6}$ yards left.**Examples:****B- Find the difference.**

$$\begin{array}{r}
 3) 5 \underline{3} - 4 \underline{1} \\
 4 \quad 2
 \end{array}$$

$$\begin{array}{r}
 4) 7 \underline{1} - 3 \underline{5} \\
 9 \quad 18
 \end{array}$$

$$\begin{array}{r}
 5 + 4 \underline{3} - \underline{1} \\
 4 \quad 2
 \end{array}$$

$$\begin{array}{r}
 7 - 3 \underline{1} - \underline{5} \\
 9 \quad 18
 \end{array}$$

$$\begin{array}{r}
 9 \underline{3} - 1 \times 2 \\
 4
 \end{array}$$

$$\begin{array}{r}
 4 \underline{1} \times 9 - 5 \\
 18
 \end{array}$$

$$\begin{array}{r}
 9 \underline{3} - \underline{2} \\
 4
 \end{array}$$

$$\begin{array}{r}
 4 \underline{9} - 5 \\
 18
 \end{array}$$

$$\begin{array}{r}
 9 \underline{1} \\
 4
 \end{array}$$

$$\begin{array}{r}
 4 \underline{4} = 4 \underline{2} \\
 18 \quad 9
 \end{array}$$