Adding and subtracting mixed numbers

We can add and subtract mixed numbers, each of which is the sum of a whole number and a fraction.

When we need to add or subtract mixed numbers, we deal with the whole numbers separately from the fractions, and we find a common denominator for the fractions.

Let's try an example of addition of mixed numbers.

Example

Find the sum.

$$6\frac{3}{7}+2\frac{1}{4}$$

First, we'll separate the whole numbers from the fractions.

$$(6+2)+\left(\frac{3}{7}+\frac{1}{4}\right)$$

Next, we'll find a common denominator for the fractions.

$$(6+2)+\left[\frac{3}{7}\left(\frac{4}{4}\right)+\frac{1}{4}\left(\frac{7}{7}\right)\right]$$

$$(6+2)+\left(\frac{12}{28}+\frac{7}{28}\right)$$

Now we'll add the whole numbers and the fractions separately.

$$8 + \frac{19}{28}$$

As a mixed number, the answer is

$$8\frac{19}{28}$$

If we want to convert this to an improper fraction, we'll take the following steps:

$$8\frac{19}{28} = \frac{(28 \times 8) + 19}{28}$$

$$8\frac{19}{28} = \frac{224 + 19}{28}$$

$$8\frac{19}{28} = \frac{243}{28}$$

Let's try an example of subtraction of mixed numbers.

Example

Find the difference.

$$6\frac{3}{7} - 2\frac{1}{4}$$

First, we'll separate the whole numbers from the fractions.

$$(6-2)+\left(\frac{3}{7}-\frac{1}{4}\right)$$

Next, we'll find a common denominator for the fractions.

$$(6-2)+\left[\frac{3}{7}\left(\frac{4}{4}\right)-\frac{1}{4}\left(\frac{7}{7}\right)\right]$$

$$(6-2)+\left(\frac{12}{28}-\frac{7}{28}\right)$$

Now we'll subtract the whole numbers and the fractions separately.

$$4+\frac{5}{28}$$

As a mixed number, the answer is

$$4\frac{5}{28}$$

If we want to convert this to an improper fraction, we'll take the following steps:

$$4\frac{5}{28}=\frac{(28\times 4)+5}{28}$$

$$4\frac{5}{28}=\frac{112+5}{28}$$

$$4\frac{5}{28}=\frac{117}{28}$$