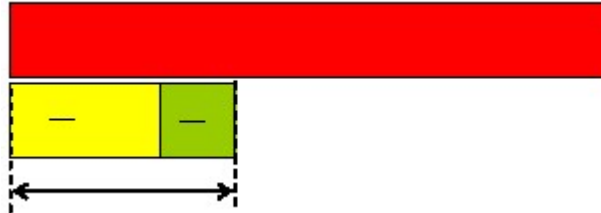# Model Addition of Unlike Fractions

Use fraction bars to add fractions.

Show $\frac{1}{4} + \frac{1}{8}$ with fraction bars.

Now, find like fraction bars that fit exactly under the sum of $\frac{1}{4} + \frac{1}{8}$.

So, three eighth bars fit under the sum.

So, $\frac{1}{4} + \frac{1}{8} = \frac{3}{8}$

Examples:

A- Find the sum. Write it in simplest form. (Draw your fraction bar)

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

$\frac{7}{4}$

2) $\frac{5}{6} + \frac{2}{3}$

$\frac{9}{6} = \frac{3}{2}$
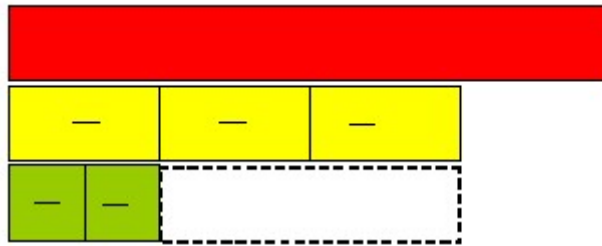
3) $\frac{2}{7} + \frac{3}{5}$

$\frac{31}{35}$

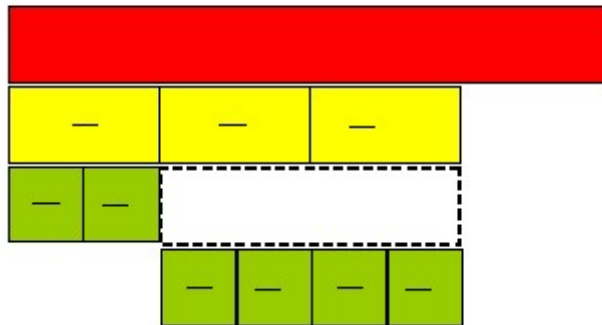4) $\frac{4}{3} + \frac{2}{5}$

$\frac{26}{15}$

Use fraction bars to subtract fractions.

Show $\dfrac{3}{4}$ - $\dfrac{2}{8}$ with fraction bars.

Now, find like fraction bars that fit exactly under the difference $\dfrac{3}{4}$ - $\dfrac{2}{8}$

So, four eighth bars fit under the difference.

So, $\dfrac{3}{4}$ - $\dfrac{2}{8}$ = $\dfrac{4}{8}$ = $\dfrac{1}{2}$

Examples:

B- Find the sum. Write it in simplest form. (Draw your fraction bar)

5) $\dfrac{5}{3}$ - $\dfrac{4}{7}$ 6) $\dfrac{7}{3}$ - $\dfrac{7}{9}$ 7) $\dfrac{3}{4}$ - $\dfrac{1}{5}$ 8) $\dfrac{2}{5}$ - $\dfrac{1}{10}$

$\dfrac{23}{21}$ $\dfrac{12}{9} = \dfrac{4}{3}$ $\dfrac{11}{20}$ $\dfrac{3}{10}$

When you add or subtract two fractions with unlike denominators, you need to make the denominators the same. Find the least common denominator (LCD), and change the fractions to like fractions with that denominator.

Add $\dfrac{2}{3}$ + $\dfrac{1}{4}$ = n

STEP 1

Find the multiples of both denominators to determine LCD.

3: 3, 6, 9, 12, ...
4: 4, 8, 12, ...
The LCM of 3 and 4 is 12. So, the LCD of $\frac{2}{3}$ and $\frac{1}{4}$ is 12.

STEP 2

Use the LCD to make like fractions. Multiply the numerator and denominator by the same number.

$$\frac{2}{3} = \frac{2 \times 4}{3 \times 4} = \frac{8}{12}$$

$$\frac{1}{4} = \frac{1 \times 3}{4 \times 3} = \frac{3}{12}$$

STEP 3

Add the fractions.

$$
\begin{array}{r}
\frac{8}{12} \\
+ \ \frac{3}{12} \\
\hline
\frac{11}{12}
\end{array}
$$

So, n = $\frac{11}{12}$

So, the sum of $\frac{2}{3} + \frac{1}{4} = \frac{11}{12}$

This answer is in simplest form

To subtract fractions with unlike denominators, follow these 3 steps. However, in Step 3, subtract the fractions and write the answer in simplest form.

<u>Examples:</u>

C- Find the sum or difference.

9) $\dfrac{1}{3} + \dfrac{2}{6}$ 　　　10) $\dfrac{2}{5} - \dfrac{1}{6}$ 　　　11) $\dfrac{4}{6} - \dfrac{5}{8}$ 　　　12) $\dfrac{3}{4} + \dfrac{1}{2}$

$\dfrac{1 \times 2 + 2}{3 \times 2 \quad 6}$ 　　$\dfrac{2 \times 6 - 1 \times 5}{5 \times 6 \quad 5 \times 6}$ 　　$\dfrac{4 \times 8 - 5 \times 6}{6 \times 8 \quad 8 \times 6}$ 　　$\dfrac{3 + 1 \times 2}{4 \quad 2 \times 2}$

$\dfrac{2+2}{6}$ 　　　　$\dfrac{12 - 5}{30}$ 　　　　$\dfrac{32 - 30}{48}$ 　　　　$\dfrac{3 + 2}{4}$

$\dfrac{4}{6} = \dfrac{2}{3}$ 　　　　$\dfrac{7}{30}$ 　　　　$\dfrac{2}{48} = \dfrac{1}{24}$ 　　　　$\dfrac{5}{4}$