

Fractions 7: Finding Common Denominators

If you were to add 2 apples and 5 pears you'd have to find a common name for the sum, such as "fruit." In order to add or subtract fractions with unlike denominators, such as $\frac{2}{6}$ and $\frac{5}{8}$, a common denominator must likewise be found. Here's how.

Recall that when you multiply any number by 1 the value remains unchanged, such as 1×3 is still 3. Also recall that $\frac{2}{2}$, $\frac{3}{3}$, $\frac{4}{4}$, etc. are each alternative names for 1.

The process used to find common denominators is like the opposite of simplifying a fraction. That is, we must multiply (instead of divide) both the numerator and the denominator of a fraction by a single number in order to increase their individual sizes.

Examine: $\frac{4 \times 2}{4 \times 6} = \frac{8}{24}$ $\frac{3 \times 5}{3 \times 8} = \frac{15}{24}$ In this example, 24 is the smallest number which is a *common* multiple of both 6 and 8. It is important that you understand that neither of these two fractions ($\frac{2}{6}$ and $\frac{5}{8}$) has actually been changed by this process of renaming. Simply another *form* of each of these fractions is being used in order to make their addition or subtraction mathematically possible. Their values remain the same.

Solving the problems below requires finding a common denominator for each. Note that sometimes one of the denominators is itself a multiple of the other denominator and is therefore the common denominator needed (see problem #1)

1.

$$\begin{array}{r} \frac{1}{4} = \frac{\quad}{8} \\ + \frac{5}{8} = \frac{\quad}{8} \\ \hline \end{array}$$

2.

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

3.

$$\begin{array}{r} \frac{5}{6} = \frac{\quad}{\quad} \\ + \frac{1}{15} = \frac{\quad}{\quad} \\ \hline \end{array}$$

4.

$$\begin{array}{r} \frac{1}{12} = \frac{\quad}{\quad} \\ + \frac{1}{4} = \frac{\quad}{\quad} \\ \hline \end{array}$$

5.

$$\begin{array}{r} \frac{1}{5} = \frac{\quad}{\quad} \\ + \frac{7}{15} = \frac{\quad}{\quad} \\ \hline \end{array}$$

6.

$$\begin{array}{r} \frac{2}{5} = \frac{\quad}{\quad} \\ + \frac{4}{10} = \frac{\quad}{\quad} \\ \hline \end{array}$$

7.

$$\begin{array}{r} \frac{2}{9} = \frac{\quad}{\quad} \\ + \frac{4}{6} = \frac{\quad}{\quad} \\ \hline \end{array}$$

8.

$$\begin{array}{r} \frac{1}{2} = \frac{\quad}{\quad} \\ + \frac{2}{8} = \frac{\quad}{\quad} \\ \hline \end{array}$$

9.

$$\begin{array}{r} \frac{2}{4} = \frac{\quad}{\quad} \\ + \frac{3}{9} = \frac{\quad}{\quad} \\ \hline \end{array}$$

10.

$$\begin{array}{r} \frac{1}{3} = \frac{\quad}{\quad} \\ + \frac{3}{9} = \frac{\quad}{\quad} \\ \hline \end{array}$$

11.

$$\begin{array}{r} \frac{6}{8} = \frac{\quad}{\quad} \\ + \frac{1}{6} = \frac{\quad}{\quad} \\ \hline \end{array}$$

12.

$$\begin{array}{r} \frac{1}{3} = \frac{\quad}{\quad} \\ + \frac{1}{6} = \frac{\quad}{\quad} \\ \hline \end{array}$$

1	
2	
3	
4	
5	
6	
7	
8	
9	
10	
11	
12	