

Math, you can do it!

Fractions, add - subtract

by Bill Hanlon

Before we can add or subtract fractions, we have to be able to find a common denominator. A common denominator (CD) is just a number that all other denominators will divide into equally.

The reason we need a CD is so when we add fractions, we can write a denominator that tells us how many equal pieces make one whole unit.

While there are many ways of finding a common denominator, we will just look at two.

Finding common denominators

1. Multiply the denominators together.

Example

Find the common denominator for $1/5$ and $2/7$.

Multiplying, $5 \times 7 = 35$. The CD is 35.

For larger denominators or numbers you are not as familiar, try this method.

2. Write the denominators as a fraction, reduce, and cross multiply.

Example

Find the common denominator for $7/20$ and $5/32$.

Write the denominators as a fraction and reduce.

$$\frac{20}{32} = \frac{5}{8}$$

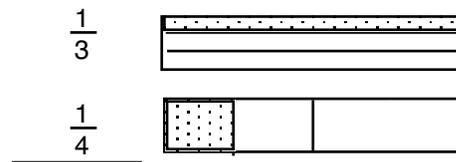
Notice that $32 \times 5 = 160$ as is 8×20 . The common denominator is 160. Piece of cake, don't you think?

Now, we can add fractions.

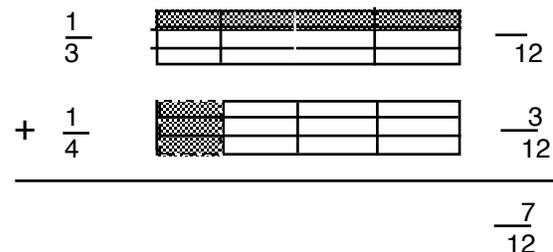
If I asked you to add $1/4$ to $1/3$, would the result be $2/7$?

Remember, the numerator tells you how many EQUAL pieces you have, the denominator tells you how many EQUAL pieces make one whole unit.

Looking at the following picture, we can see that's not happening, so the answer is NO.



We can clearly see the pieces are not equal. So we make more cuts on the cake to make equal pieces, that's called finding a common denominator.



By making the additional cuts, all the pieces are equal. Now I can add the numerators to find out how many equal pieces I have and bring down the denominator so I know how many equal pieces are in one whole unit.

To do that without drawing a picture, we use the following algorithm.

ADD/SUB FRACTIONS

1. Find the common denominator
2. Make equivalent fractions
3. Add/Sub the numerators
4. Bring down the denominator
5. Reduce

Example $3/5 + 1/4$

$$\begin{array}{r} \frac{3}{5} = \frac{12}{20} \\ + \frac{1}{4} = \frac{5}{20} \\ \hline \frac{17}{20} \end{array}$$

Understanding why this works and memorizing the algorithm are equally important to your future success.