

Math, you can do it!

Fractions; multiply - divide

by Bill Hanlon

What did the fraction say to the whole number?
You crack me up!

Multiplying fractions is a piece of cake. Let's take a look at the algorithm.

Multiplying Fractions

1. Make sure you have fractions
2. Cancel, if possible
3. Multiply numerators
4. Multiply denominators
5. Reduce

Example $\frac{3}{5} \times \frac{4}{7}$

We have fractions, we can not cancel, so all we do is multiply the numerators, then multiply the denominators.

$$\frac{3}{5} \times \frac{4}{7} = \frac{12}{35}$$

Example $3 \frac{1}{5} \times \frac{2}{7}$

In this example, $3 \frac{1}{5}$ is NOT a fraction, it's a mixed number. So I have to convert.

So the problem now looks like this

$$\frac{16}{5} \times \frac{2}{7}$$

I can't cancel, so I multiply the numerators, then the denominators.

$$\frac{16}{5} \times \frac{2}{7} = \frac{32}{35}$$

Let's take a look at dividing fractions. You might remember this little diddy from school; "Yours is not to reason why, when dividing fractions, flip, and multiply".

While knowing how to divide fractions is important, knowing why is just as important.

Remember dividing with whole numbers was sometimes defined as repeated subtraction. So when asked to divide 8 by 2, we found how many times we could subtract 2 from 8. It turned out the answer was 4.

The concept of division does not change. If I asked you to divide $\frac{3}{4}$ by $\frac{1}{8}$, we would want to know how many $\frac{1}{8}$'s are in $\frac{3}{4}$. In other words we would use the repeated subtraction model again.

To be frank, that would be a lot of work. That good news is that someone noticed a pattern that would allow us to do those problems quicker. Let's look at the shortcut, known as the division algorithm

Dividing Fractions

1. Make sure you have fractions
2. Invert the divisor
3. Cancel, if possible
4. Multiply numerators
5. Multiply denominators
6. Reduce

Example $2 \frac{1}{3} \div \frac{1}{6}$

Changing $2 \frac{1}{3}$ to a fraction, we have $\frac{7}{3}$

$$\frac{7}{3} \div \frac{1}{6}$$

Inverting the divisor, $\frac{7}{3} \times \frac{6}{1}$

Canceling $\frac{7}{13} \times \frac{6^2}{1} = 14$

Remember, when you are multiplying or dividing fractions with mixed numbers, you first have to convert them to improper fractions.

Again, memorizing the multiplication and division algorithms is just as important as understanding why the algorithms works. Algorithms are just procedures that will allow you to do problems quickly.

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