

When you divide one fraction by another why do you have to turn the second one upside down then multiply them?

Question

$$\frac{1}{2} \div \frac{3}{4}$$

- We'll solve this question.
- We know we would turn the second fraction upside down then multiply them to get the answer.
- The real question is WHY do we do this?!

Question

$$\frac{1}{2} \div \frac{3}{4}$$

$$\begin{array}{r} \frac{1}{2} \\ \hline \frac{3}{4} \end{array}$$

- Fractions are really just division sums, numerator divided by denominator (top ÷ bottom) so we can rewrite the question as shown

Question

$$\frac{1}{2} \times \frac{4}{3} = \frac{4}{6}$$

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

- If we multiply the numerator and denominator of a fraction by the same number we get an equivalent fraction. **(It's still the same division sum).**
- Lets multiply top and bottom by the reciprocal of the bottom fraction.

Question

$$\frac{\frac{1}{2}}{\frac{3}{4}} = \frac{\frac{4}{6}}{\frac{12}{12}} = \frac{\frac{4}{6}}{1} = \frac{4}{6}$$

- Now the denominator of the big fraction is equal to 1 since $12 \div 12 = 1$.
- Anything divided by 1 is itself so the answer is $4/6$!

Compare the methods

$$\frac{1}{2} \div \frac{3}{4}$$

$$\frac{1}{2} \times \frac{4}{3}$$

$$= \frac{4}{6}$$

Why does
“turn the
second fraction
upside down
and multiply
them” work?

$$\frac{\frac{1}{2} \times \frac{4}{3}}{\frac{3}{4} \times \frac{4}{3}} = \frac{\frac{4}{6}}{\frac{12}{12}}$$

$$\frac{\frac{4}{6}}{\frac{12}{12}} = \frac{\frac{4}{6}}{1} = \frac{4}{6}$$