

Fractions

5) Common denominators — slightly trickier



This comes in handy for **ordering fractions** by size, and for **adding** or **subtracting** fractions. You need to find a number that **all** the denominators **divide into** — this will be your **common denominator**. The simplest way is to find the **lowest common multiple** of the denominators:

EXAMPLE:

Put these fractions in ascending order of size: $\frac{8}{3}, \frac{5}{4}, \frac{12}{5}$

The **LCM** of 3, 4 and 5 is 60,
so make 60 the **common denominator**:

$$\frac{8}{3} = \frac{160}{60}$$

$$\frac{5}{4} = \frac{75}{60}$$

$$\frac{12}{5} = \frac{144}{60}$$

So the correct order is $\frac{75}{60}, \frac{144}{60}, \frac{160}{60}$ i.e. $\frac{5}{4}, \frac{12}{5}, \frac{8}{3}$

Don't forget to use the original fractions in the final answer.

6) Adding, subtracting — sort the denominators first



- 1) Make sure the denominators are **the same** (see above).
- 2) Add (or subtract) the top lines (numerators) **only**.

If you're adding or subtracting **mixed numbers**, it usually helps to convert them to improper fractions first.

EXAMPLE:

Calculate $2\frac{1}{5} - 1\frac{1}{2}$.

Rewrite the **mixed numbers** as **fractions**:

$$2\frac{1}{5} - 1\frac{1}{2} = \frac{11}{5} - \frac{3}{2}$$

Find a **common denominator**:

$$= \frac{22}{10} - \frac{15}{10}$$

Combine the **top lines**:

$$= \frac{22 - 15}{10} = \frac{7}{10}$$

People usually find adding and subtracting fractions harder than multiplying and dividing — but it's actually pretty easy as long as you remember to make sure the denominators are the same.

7) Finding a fraction of something — just multiply



Multiply the 'something' by the **TOP** of the fraction, and **divide** it by the **BOTTOM**.

It doesn't matter which order you do those two steps in — just start with whatever's easiest.

EXAMPLE:

What is $\frac{9}{20}$ of £360?

Start by dividing by 20, that's easiest:

$$\begin{aligned} \frac{9}{20} \text{ of } £360 &= (£360 \div 20) \times 9 \\ &= £18 \times 9 \\ &= £162 \end{aligned}$$

No fractions were harmed in the making of these pages...

...although one was slightly frightened for a while, and several were tickled.

When you think you've learnt all this, try all of these Exam Practice Questions without a calculator.

Q1 Calculate: a) $\frac{3}{8} \times 1\frac{5}{12}$ [3 marks] b) $1\frac{7}{9} \div 2\frac{2}{3}$ [3 marks]

c) $4\frac{1}{9} + 2\frac{2}{27}$ [3 marks] d) $5\frac{2}{3} - 9\frac{1}{4}$ [3 marks]

Q2 Dean has baked 550 muffins. $\frac{2}{5}$ of the muffins are chocolate, $\frac{3}{11}$ are lemon and the rest are beetroot. How many beetroot muffins has Dean baked? [4 marks]