

Ratios

There's just so much great stuff to say about ratios. I couldn't possibly fit it onto only one page...

Scaling Up Ratios



If you know the ratio between parts and the actual size of one part, you can scale the ratio up to find the other parts.

EXAMPLE:

Mortar is made from sand and cement in the ratio 7:2.
If 21 buckets of sand are used, how much cement is needed?

You need to multiply by 3 to go from 7 to 21 on the left-hand side (LHS) — so do that to both sides:

$$\begin{aligned} & \text{sand:cement} \\ & = 7:2 \\ & = \times 3 \left(\begin{array}{l} 7:2 \\ 21:6 \end{array} \right) \times 3 \end{aligned}$$

So **6 buckets** of cement are needed.

EXAMPLE:

Mrs Miggins owns tabby cats and ginger cats in the ratio 3:5.
All her cats are either tabby or ginger, and she has 12 tabby cats.
How many cats does Mrs Miggins have in total?

Multiply both sides by 4 to go from 3 to 12 on the LHS:

$$\begin{aligned} & \text{tabby:ginger} \\ & = 3:5 \\ & = \times 4 \left(\begin{array}{l} 3:5 \\ 12:20 \end{array} \right) \times 4 \end{aligned}$$

So Mrs Miggins has 12 tabby cats and 20 ginger cats.
So in total she has $12 + 20 = 32$ cats



Proportional Division



In a proportional division question a TOTAL AMOUNT is split into parts in a certain ratio.
The key word here is PARTS — concentrate on 'parts' and it all becomes quite painless:

EXAMPLE:

Jess, Mo and Greg share £9100 in the ratio 2:4:7. How much does Mo get?

1) ADD UP THE PARTS:

The ratio 2:4:7 means there will be a total of 13 parts:

$$2 + 4 + 7 = 13 \text{ parts}$$

2) DIVIDE TO FIND ONE "PART":

Just divide the total amount by the number of parts:

$$£9100 \div 13 = £700 \text{ (= 1 part)}$$

3) MULTIPLY TO FIND THE AMOUNTS:

We want to know Mo's share, which is 4 parts:

$$4 \text{ parts} = 4 \times £700 = £2800$$

Ratio Nelson — he proportionally divided the French at Trafalgar...

Learn the rules for simplifying, how to scale ratios up and the three steps for proportional division.
Now turn over and write down what you've learned. Then try these:

Q1 Simplify: a) 25:35 b) 3.4:5.1 c) $\frac{9}{4} : \frac{15}{2}$ [4 marks]

Q2 Porridge and ice cream are mixed in the ratio 7:4.
How much porridge should go with 12 bowls of ice cream? [1 mark]

Q3 Divide £8400 in the ratio 5:3:4. [3 marks]