Ratios

A ratio is a way of comparing two numbers or quantities. Ratios can be used to compare costs, weights and sizes …

Example 1:
To make a mixer full of concrete you need 15 shovels of sand, 9 shovels of gravel and 6 shovels of cement.
John needs 4 mixers full of concrete.
How much sand, gravel and cement will he need?

The ratio of sand to gravel to cement is **15 : 9 : 6**
So he will need :
sand: 15x4=**60** shovels
gravel: 9x4=**36** shovels
cement: 6x4=**24** shovels

the ratios **60:36:24** and **15:9:6** are **equivalent.**

Example 2
If the ratio of teachers to student is 1:30 (or one per class of 30) then three classes will need a ratio of 3:90 since 1:30 and 3:90 are equivalent ratios. **1:30=3:90**

Exercises

1. Calculate the missing numbers in these ratios:
   (a) 3 : 5 = 12 : ? **(b)** 4 : 7 = 16 : ?
   (c) 6 : 5 = 3 : ? **(d)** 4 : 5 = ? : 35

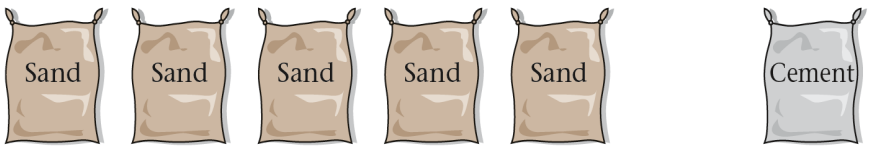
2. The number of mugs made in a pottery in the morning and in the afternoon are in the ratio 4 : 9. They are always completed in this ratio.
   (a) How many mugs are made in the afternoon when 60 are made in the morning?
   (b) How many are made in the morning when 189 are made in the afternoon?

3. The ratio of students going home for lunch to students staying at school for lunch is 3 : 5. When 273 students go home for lunch how many stay at school?

4. £360 is divided between Sally and Nadir in the ratio 5 : 4. How much should each person receive?

5. Nick, Mark and Gavin share £480 in the ratio 4 : 5 : 3. How much should each person receive?

6. Mortar is made by mixing 5 parts by weight of sand with 1 part by weight of cement. How much sand is needed to make 8400 kg of mortar?



7. The angles of a triangle are in the ratio 6 : 5 : 7. Find the sizes of the three angles.

8. An alloy is made from iron, copper, nickel and phosphorus in the ratio 6 : 4 : 3 : 1. Find the weight of (a) iron (b) copper (c) nickel (d) phosphorus in 714 g of the alloy.