Lesson 6

Ratio : GCSE

6.1 Ratio Revision

Example #1
Ratios cancel down, or simplify, much like fractions do.

(i) 6 : 9

(ii) 48 : 36

(iii) 21 : 33 : 18

Example #2
If £100 is divided into two piles in the ratio 2 : 3 it means
$\frac{2}{5}$ of £100 is in one pile and $\frac{3}{5}$ of £100 is in the other.
Why fifths ?

If you were counting out the money you'd put
£2 in the first pile, £3 in the other,
and £2 in the first pile, £3 in the other,
and £2 in the first pile, £3 in the other.....
and so on until the £100 was all counted out.

(i) Work out $\frac{2}{5}$ of £100.

(ii) Work out $\frac{3}{5}$ of £100.

(iii) What should answers **(i)** and **(ii)** sum to ?

Example #3
A salad dressing is made from oil and vinegar mixed in the ratio 3 : 5.
(a) How much oil is contained in 200ml of dressing ?

(b) If only 50ml of vinegar is available, how much dressing can be made ?

6.2 Exercise

Question 1
Cancel down, (i.e. simplify), these ratios;

(i) 8 : 12 **(ii)** 20 : 35 **(iii)** 24 : 16 : 32

Question 2
Fernal decides to spend his £400 Christmas money on clothes, iTunes, and books in the ratio 5 : 3 : 2.

How much does Fernal spend on iTunes ?

Question 3
GCSE exam question, May 2007 4H
Anji mixes sand and cement in the ratio 7 : 2 by weight.
The total weight of the mixture is 27 kg.

Calculate the weight of sand in the mixture.

Question 4
GCSE exam question, May 2008, 3H
Bronze is made from copper and tin.
The ratio of the weight of copper to the weight of tin is 3 : 1.

Work out the weight of copper in 280 grams of bronze.

Question 5
IGCSE exam question, November 2006, 4H
The total of Kim's age and Pablo's age is 45 years.
The ratio of Kim's age to Pablo's age is 1 : 4.

Work out Kim's age.

Question 6
GCSE exam question, May 2006, 3H
The perimeter of a triangle is 54 cm.
The lengths of its sides are in the ratio 2 : 3 : 4.

Work out the length of the longest side of the triangle.

Question 7
GCSE specimen exam question, 3H
Mortar is made from cement, lime and sand.
The ratio of their weights is 2 : 1 : 9.

Work out the weight of cement and the weight of sand in 60 kg of mortar.

Weight of cement .....kg Weight of sand .....kg

Question 8

GCSE exam question, May 2004, 4H

Plumbers' solder is made from tin and lead.

The ratio of the weight of tin to the weight of lead is 1 : 2

(a) Work out the weight of tin and the weight of lead in 120 grams of solder.

Weight of tin .....g Weight of lead .....g

(b) What weight of plumbers' solder contains 25 grams of tin ?

Question 9

GCSE exam question, November 2006, 3H

Rajesh and Gudi share some money in the ratio 2 : 5

Rajesh receives £240.

Work out the amount of money that Gudi receives.

Question 10

GCSE exam question, November 2007, 4H

In 2004, the ratio of the number of planes in Air China's fleet to the number of planes in Malaysian Airlines' fleet was 6 : 7.

There were 72 planes in Air China's fleet.

Work out the number of planes in Malaysian Airlines' fleet.

Question 11

GCSE exam question, November 2005, 4H

Two fruit drinks, *Fruto* and *Tropica*, are sold in cartons.

(a) *Fruto* contains only orange and mango.
The ratio of orange to mango is 3 : 2.
A carton of *Fruto* contains a total volume of 250 cm^3.

Find the volume of orange in a carton of *Fruto*.

(b) *Tropico* contains only lemon, lime and grapefruit.
The ratios of lemon to lime to grapefruit are 1 : 2 : 5.
The volume of grapefruit in a carton of *Tropico* is 200 cm^3.

Find the total volume of *Tropico* in a carton.

Question 12

I am using an Ordnance Survey "Landranger Map".
It has a scale of 1 : 50 000.
On the map, I note that the walk planned is 8 cm long.

(a) How many cm are in 1 km ?

(b) How long, in reality, is my walk ?
Give your answer in km.

Question 13

GCSE exam question, May 2005, 3H

The height of a hall is 12 m.
A scale model is made of the hall.
The height of the scale model of the hall is 30 cm.

(a) Express the scale of the model in the form 1 : *n*

The length of the scale model of the hall is 95 cm.

(b) Work out the real length of the hall.
Give your answer in metres.

Question 14

I am using an orienteering map with a scale of 1 : 10 000

On the ground, I jog 2.5 km.

How far have I moved across the map ?
Give your answer in cm.