

## Comparing Quantities Using Fractions and Ratios

Eg1 Write 36 as a fraction of 45.

To do this, put 36 over 45 and cancel down.

$$\frac{36}{45} = \frac{4}{5}$$

Eg2 What fraction must you multiply 45 by to get 36?

This is the fraction you have just found.

Check by doing  $\frac{4}{5} \times 45 = 36$ .

Answer all these questions in their simplest form.

- 1 Write 24 as a fraction of 30.
- 2 Write 35 as a fraction of 50.
- 3 Write 28 as a fraction of 42.
- 4 Write 18 as a fraction of 36.
- 5 Write 24 as a fraction of 60.
- 6 Write 21 as a fraction of 30.
- 7 Write 28 as a fraction of 70.
- 8 Write 54 as a fraction of 60.
- 9 Write 42 as a fraction of 70.
- 10 Write 64 as a fraction of 88.
- 11 Write 9 as a fraction of 6.
- 12 Write 26 as a fraction of 4.
- 13 Write 28 as a fraction of 8.
- 14 Write 25 as a fraction of 20.
- 15 Write 66 as a fraction of 44.
- 16 Write 52 as a fraction of 20.
- 17 Write 35 as a fraction of 15.
- 18 Write 49 as a fraction of 35.
- 19 Write 16 as a fraction of 12.
- 20 Write 32 as a fraction of 28.
- 21 What fraction must you multiply 36 by to get 32?
- 22 What fraction must you multiply 42 by to get 14?
- 23 What fraction must you multiply 50 by to get 28?
- 24 What fraction must you multiply 45 by to get 20?
- 25 What fraction must you multiply 36 by to get 12?
- 26 What fraction must you multiply 86 by to get 50?
- 27 What fraction must you multiply 66 by to get 27?

Colour of sweets	Frequency (Number)
Yellow	14
Green	4
Purple	20
Black	2
Red	25

For the following questions, use the table above to help you to answer the questions.

- 28 Write the number of sweets as a fraction of the total number of sweets.
- 29 Write the number of red sweets as a fraction of the total number of red and purple sweets.
- 30 Complete this sentence:

The number of \_\_\_\_\_ sweets as a fraction of the number of \_\_\_\_\_ sweets is  $\frac{5}{4}$ .

Eg3 A recipe calls for four times as much flour as sugar.

Write the amount of flour to the amount of sugar as a ratio.

flour : sugar = 4 : 1

Write the amount of sugar compared to the amount of flour as a fraction.

The recipe needs  $\frac{1}{4}$  as much sugar as flour.

Write the following statements as ratios of CDs and DVDs.

- 1 Lucy has twice as many DVDs as CDs.
- 2 Peter has five times as many CDs as DVDs.
- 3 Simon has three times as many DVDs as CDs.
- 4 Nancy has eight times as many CDs as DVDs.

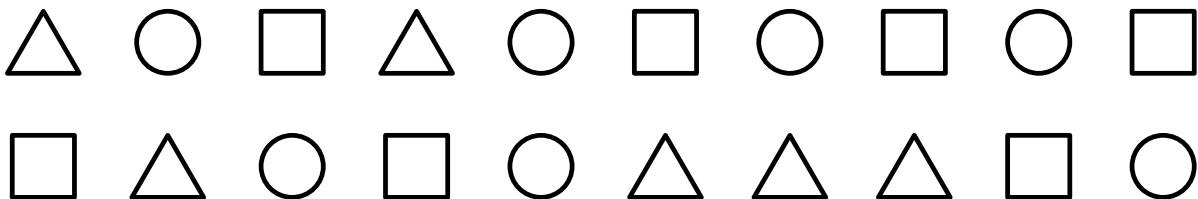
Harry is given a bag containing lego.  $\frac{2}{3}$  of the lego bricks are red. The rest are white.

- 1 What fraction of the bricks are white?
- 2 Write down the ratio of red to white bricks.
- 3 Write down the number of red bricks as a fraction of the number of white bricks.

A bakery sells only white and wholemeal loaves. The ratio of white to wholemeal loaves is 5:3.

- 1 Write the number of wholemeal loaves sold as a fraction of the number of white loaves sold.
- 2 Write the number of white loaves sold as a fraction of the number of wholemeal loaves sold.
- 3 Write the number of white loaves sold as a fraction of the total number of loaves sold.

Write down the ratio of the number of squares to circles to triangles.



Write the following ratios in their simplest form

- |   |         |   |            |
|---|---------|---|------------|
| 1 | 3:6:12  | 5 | 6:12:20    |
| 2 | 4:16:30 | 6 | 48:56:24   |
| 3 | 5:15:50 | 7 | 16:48:90   |
| 4 | 8:24:28 | 8 | 18:20:8:32 |

## Writing Ratios in the form 1:n

Eg4 Write the ratio 20:25 in the form 1:n

Simplify the ratio so, by dividing both sides by 5, you get 4:5.

Divide both sides by the number on the left, ie 4, you get 1:1.25

This is the only time you end up with a fraction in ratios.

Write the following in the form, 1:n.

- 1 35:70
- 2 20:60
- 3 40:50
- 4 80:120
- 5 60:90
- 6 30:81
- 7 52:84
- 8 63:70

## Using Ratios

Eg5 The fuel in a car mixes fuel and air in the ratio 10:147.

The car burns 50 litres of fuel. How much air does it consume?

Work out what you need to multiply to go from 10 to 50 (ie 5).

Multiply both sides by 5.

So the fuel: air mix is 50 : 935 litres.

- 1 A pet shop has budgerigars to canaries in the ratio 2:5. If there are 25 canaries, how many budgerigars are there?
- 2 In a car park, the ratio of blue cars to red cars is 8:5. The ratio of blue cars to white cars is 7:4. There are 20 white cars.
  - a. How many red cars are there?
  - b. How many cars are there altogether?
- 3 The number of cars to motorbikes at a race track is in the ratio of 4:3. The ratio of cars to scooters is 5:2. There are 18 scooters.
  - a. How many motorbikes are there?
  - b. How many vehicles are there altogether?
- 4 In a hospital, the ratio of doctors to nurses is 3:10. The ratio of doctors to ancillary staff is 2:7. Doctors get paid £120,000 per annum. Nurses get paid £39,500 per annum and ancillary staff get paid £16,250 per annum.
  - a. How many nurses are there if the total nursing bill is £4,740,000?
  - b. How many of each type of staff are there?
  - c. What does it cost to run the payroll at the hospital?
- 5 Split 420g into the ratio 4:8:9.
- 6 Split 380g in the ratio 9:4:6.
- 7 Split 4896 in the ratio 3:6:7.