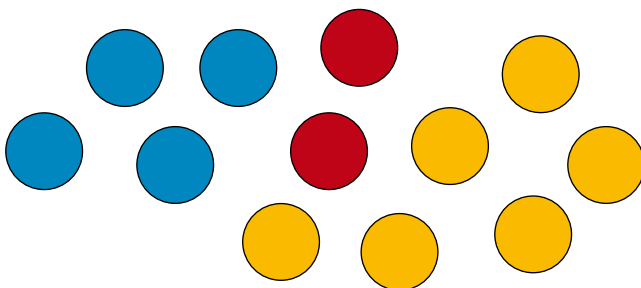# Ratio and proportion (2)

- Recognising the relationship between proportion and ratio
- Calculating unknown values using ratios
- Solving problems involving proportion

Keywords

You should know

explanation 1

1 Here is a set of 12 counters.

a What proportion of the counters are these colours? Give your answers as fractions in their lowest terms.

   i Orange   **ii** Red   **iii** Blue   **iv** Not blue

b Write these ratios in their simplest form.

   i Blue counters to red counters   **ii** Red counters to orange counters

   iii Orange to blue counters   **iv** Red counters to not red counters

2 A bag of sweets contains caramels and toffees.

The proportion of caramels in the bag is $\frac{2}{3}$.

a What proportion of sweets in the bag are toffees?

b What is the ratio of caramels to toffees in the bag?

c There are 10 caramels in the bag. How many toffees are there?

3 Boxes of pencils have blue and red pencils in the ratio $1:3$.

   a Copy and complete.   The ratio of blue pencils to red pencils is $1:3$.
                              For every 1 blue pencil there are ☐ red pencils.

   b **i** When there are 30 blue pencils, how many red pencils are there?

        ii When there are 30 red pencils, how many blue pencils are there?

   c **i** What fraction of the pencils in the box are blue?

        ii What fraction of the pencils in the box are red?

4 Write each ratio in its simplest form.

   a $6:12$ **b** $21:9$ **c** $14:35$ **d** $45:15$

   e $16:20$ **f** $24:36$ **g** $16:32$ **h** $120:30$

   i $88:33$ **j** $75:15$ **k** $42:49$ **l** $16:64$

5 **a** Write £3 as an amount of money in pence.

   b Explain why the ratio $£3:50p$ simplifies to $6:1$.

6 Write each of these ratios in its simplest form.

   a $£1:20p$ **b** $20\,mm:3\,cm$ **c** $10\,cm:6\,mm$

   d $1\,km:300\,m$ **e** $£1.80:90p$ **f** $45\,cm:1\,m$

7 A bag contains 24 different coloured counters.

Work out how many counters of each colour are in the bag by following these clues.

   i The proportion of blue counters is 25%.

   ii The ratio of blue to red counters is $3:2$.

  iii The proportion of yellow counters to red counters is $2:1$.

   iv The ratio of green to orange counters is $1:2$.

explanation 2

8 Michael and Jenny share out some sweets in the ratio $1:3$.

   a If Michael has 12 sweets then how many does Jenny have?

   b If Jenny has 12 sweets then how many does Michael have?

9 Ava mixes blue and yellow paint in the ratio $2:1$ to

   a Ava uses 8 litres of blue paint.
     How much yellow paint does she need?

   b Ava uses 8 litres of yellow paint.
     How much blue paint does she need?

10 Tariq and Sarah share some money in the
ratio $2:5$.

   a If Tariq receives £100, how much does Sarah receive?

   b If Sarah receives £100, how much does Tariq receive?

   c What fraction of the money does Tariq receive?

   d What fraction of the money does Sarah receive?

11 Jasmine and Paul share some football stickers in the ratio $7:4$.

   a If Jasmine has 14 stickers then how many does Paul have?

   b If Paul has 12 stickers then how many does Jasmine have?

12 At a bowling alley the ratio of girls to boys is always $2:1$.

   a When there are 20 girls, how many boys are there?

   b When there are 20 boys, how many girls are there?

13 A shade of purple is made by mixing blue and red paint in the ratio $5:2$.

   a How many litres of red paint would you need to mix with 10 litres of
blue paint?

   b How many litres of blue paint would you need to mix with 6 litres of
red paint?