

TARGET To use ratio to solve problems involving the relative sizes of two quantities.

Example 1

A prize of £200 is shared 3 : 2 between Diane and Dave. How much should they receive each?

- 1 Find the number of shares.
 $5 (3 + 2 = 5)$
- 2 Find the value of each share.
 $£40 (£200 \div 5 = £40)$
- 3 Work out how much is received each.
Diane £120 ($£40 \times 3$)
Dave £80 ($£40 \times 2$)

Example 2

The ratio of boys to girls in a school is 6 : 5. There are 168 boys in the school. How many children are there altogether?

- 1 Find the total number of parts.
 $11 (6 + 5 = 11)$
- 2 Find the value of one part.
 $28 (168 \div 6 = 28)$
- 3 Work out the number of children.
 $308 (28 \times 11 = 308)$

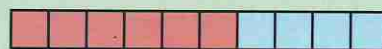
Example 3

The ratio of adults to children at a cinema is 3 : 4. There are 111 adults in the cinema. How many children are there?

- 1 Find the number of parts.
 $7 (3 + 4 = 7)$
- 2 Find the value of each part.
 $37 (111 \div 3 = 37)$
- 3 Work out the number of children.
 $148 (37 \times 4 = 148)$

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A row of tiles is laid with this repeating pattern.



- 1 How many blue tiles are there if there are:
a) 12 red tiles b) 30 red tiles?
- 2 How many red tiles are there if there are:
a) 12 blue tiles b) 40 blue tiles?

In a raffle there is one prize for every 20 tickets.

- 3 How many prizes are there if:
a) 120 tickets are sold
b) 500 tickets are sold?
- 4 How many tickets have been sold if there are:
a) 9 prizes b) 17 prizes?
- 5 In Year 6 the ratio of dinners to packed lunches is 2 : 1. Forty children have a dinner. How many have a packed lunch?
- 6 In a class the ratio of boys to girls is 3 : 4. There are 16 girls. How many boys are there?
- 7 The ratio of red to green apples in a bowl is 3 : 1. If there are 15 red apples, how many apples are green?
- 8 At a market the ratio of blue jeans sold to black jeans sold is 7 : 2. If 6 black jeans are sold, how many blue jeans are sold?



TARGET To use and simplify the notation of ratio.

EXPRESSING RATIOS

Fractions compare part to whole.

Ratios compare part to part.

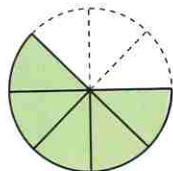
Example 1

A cake is cut into 8 equal slices.

3 slices are eaten.

$\frac{3}{8}$ eaten

$\frac{5}{8}$ uneaten



The ratio of eaten to uneaten slices is 3 to 5.

This is written as 3 : 5.

Example 2

Seven of the footballers in a team are right-footed, four are left-footed.

The ratio of right- to left-footed players is 7 : 4.

SIMPLIFYING RATIOS

Writing a ratio in its lowest terms makes it easier to use. As with cancelling fractions, ratios are simplified by dividing each number by the highest common factor.

Example 1

In a test Jamil gets 15 questions right and 5 questions wrong. The ratio of right to wrong answers is 15 : 5, which can be simplified to 3 : 1.

Example 2

Simplify these ratios:

$$2:8 \rightarrow 1:4$$

$$21:6 \rightarrow 7:2$$

$$25:40 \rightarrow 5:8$$

A

- 1 Jess has been on holiday for 4 days. He has 10 days left. Write the ratio of days gone to days left in its lowest terms.



- 2 In a hospital ward there are 2 doctors and 10 nurses. Write the ratio doctors : nurses in its lowest terms.
- 3 A builder mixes 12 kg of sand and 4 kg of cement. Write the ratio sand : cement in its lowest terms.
- 4 Terri takes 14 photos. She saves 8 and deletes 6. Write the ratio of photos saved to photos deleted in its lowest terms.
- 5 In a squad of 15 footballers, 3 are left-footed and 12 are right-footed. Write the ratio of left-footed to right-footed players in its lowest terms.
- 6 There are 25 adults and 20 children on a bus. Write the ratio adults : children in its lowest terms.
- 7 In a quiz Bernie gets 12 answers right and 8 wrong. Write the ratio of right to wrong answers in its lowest terms.
- 8 At playtime 6 teachers have a mug of tea and 14 have coffee. Write the ratio tea : coffee in its lowest terms.
- 9 Write these ratios in their lowest terms.
- | | |
|------------|------------|
| a) 4 : 6 | e) 14 : 16 |
| b) 15 : 20 | f) 40 : 10 |
| c) 6 : 3 | g) 15 : 9 |
| d) 10 : 12 | h) 8 : 20 |