

RATIO AND PROPORTION

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TARGET To solve problems involving ratio and proportion.

Ratio compares part to part.

Proportion compares part to whole.

Example 1

A necklace is made using this pattern of beads.



Ratios of blue to red beads $2 : 3$

Proportion of blue beads $\frac{2}{5}$

Proportion of red beads $\frac{3}{5}$

Example 2

In a supermarket 2 large packets of cereal are put on the shelves for every 5 small packets. 40 small packets are put out. How many large packets are put on the shelves?

Find ratio of small to large packets.

$5 : 2$

Find value of one part.

$8 (40 \div 5 = 8)$

Work out the number of large packets put out on shelves.

$16 (8 \times 2 = 16)$

Example 3

At a swimming gala 3 in every 8 swimmers receive a medal. How many medals are awarded if there are 72 swimmers altogether?

Find proportion of swimmers receiving a medal.

$\frac{3}{8}$ (3 in every 8)

Find the number of medals awarded.

$27 (72 \div 8 = 9 \quad 9 \times 3 = 27)$

A

A necklace is made using this pattern of beads.



- Write the ratio of green beads to black beads.
- Write the proportion of the beads which is green.
- If there are 20 green beads, how many black beads are there?
- If there are 56 beads altogether, how many beads are:
a) black b) green?
- A map has a scale of 1 cm to 2 km. Two castles are 23 cm apart on the map. What is the actual distance between the castles?
- Lavinia makes jam. One jar in every 4 is plum jam. She makes 56 jars altogether. How many jars of plum jam does she make?
- A shop sells 5 ice creams to every 2 lollies it sells. 35 ice creams are sold. How many lollies are sold?
- Two in every three members of the audience at a concert are children. There are 1200 children at the concert. How many adults are in the audience?
- In Year 4 the ratio of children with a pet to those with no pet is 5 : 4. If 36 children do not have a pet, how many do?

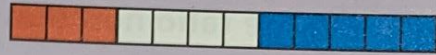


B

- 1 A bridge is 48 m tall. A scale model of the bridge is 37 cm long and 12 cm tall. How long is the actual bridge?
- 2 In a cake recipe the ratio of dried fruit to nuts is 3 : 2. What quantity of dried fruit is required if 90 g of nuts is used?
- 3 a) Five bars of chocolate cost £8.75. What do three bars cost?
b) The cost of all the bars in a box is £35.
How many bars are in a box?
- 4 The ratio of the weight of a large bag of potatoes to that of a small bag is 11 : 5. If a large bag weighs 5.5 kg, how much does a small bag weigh?
- 5 There are 360 passengers on a flight to Singapore from London. Five in every eight of the passengers are flying on to Sydney. How many of the passengers are bound for Sydney?
- 6 A factory makes 7 single beds to every 4 double beds.
a) How many double beds does it produce if it makes 91 single beds?
b) How many single beds does it produce if it makes 96 double beds?
- 7 A car uses £8 worth of petrol for every 100 km it travels. What is the cost of the petrol used to travel:
a) 70 km b) 240 km?
- 8 The profits made by a shop are shared between the owner and her assistant in a ratio of 5 : 3, the owner receiving the larger share. How much does the assistant receive if:
a) total profit is £20 000
b) the owner receives £17 435?

C

A row of tiles has this repeating pattern.



- 1 How many tiles are blue if:
a) 15 are red
b) 36 are white
c) there are 72 tiles altogether?
- 2 How many tiles are there altogether if there are:
a) 48 white tiles
b) 75 blue tiles
c) 24 red tiles?
- 3 In a vote in the House of Commons 7 in 12 votes cast are for the proposed change in law. Altogether 564 MPs vote. How many vote for the proposal?
- 4 The ratio of actors to audience in a theatre is 2 : 17. There are 391 people in the audience. How many actors are there?
- 5 In a library the ratio of fiction to non-fiction books is 6 : 5. The library has 2750 books. How many are fiction?
- 6 One kilogram of steak costs £9.60. What is the cost of:
a) 800 g b) 275 g?
- 7 The scale of a map is 1 : 250 000. What is the actual distance between:
a) two mountain summits which are 12 cm apart on the map
b) two villages which are 5 cm apart on the map?
- 8 A chemist mixes two powders. He uses 40 g of Powder A to every 25 g of Powder B.
a) How much of Powder B does he need if he uses 100 g of Powder A?
b) How much of the mixture does he make if he uses 375 g of Powder B?