

Ratio and Proportion

GCSE Mathematics • **Foundation Tier** • Grades 4–5 • Non-calculator

WORKED SOLUTIONS

Name: _____ *worked example* _____

Class: _____

Total: _____ *58* _____ / 58

Show all your working. Marks are given for correct method as well as the final answer.

1. Simplify the ratio 12 : 18. [2 marks]

divide both by 6

Answer: _____ *2 : 3* _____

2. Simplify the ratio 45 : 30 : 15. [2 marks]

divide all three by 15

Answer: _____ *3 : 2 : 1* _____

3. Write 2 : 5 in the form 1 : n . [2 marks]

divide both by 2

Answer: _____ *1 : 2.5* _____

4. Share \$60 in the ratio 2 : 3. [3 marks]

2 + 3 = 5 parts

60 ÷ 5 = 12 per part

2 × 12 = 24 3 × 12 = 36

Answer: _____ *£24 and £36* _____

5. Share 180 sweets in the ratio 4 : 5. [3 marks]

9 parts

180 ÷ 9 = 20

4 × 20 = 80 5 × 20 = 100

Answer: _____ *80 and 100* _____

6. Share \$840 in the ratio 1 : 2 : 4. [3 marks]

7 parts

840 ÷ 7 = 120

120, 240, 480

Answer: _____ *£120, £240, £480* _____

7. Two numbers are in the ratio 3 : 7. The smaller is 21. Work out the larger. [2 marks]

3 parts = 21, so 1 part = 7

7 × 7 = 49

Answer: _____ *49* _____

8. In a class the ratio of boys to girls is 5 : 4. There are 20 boys. Work out the total number of students. [3 marks]

5 parts = 20, 1 part = 4

9 parts = 36

Answer: _____ *36* _____

9. Two numbers are in the ratio 2 : 9. Their difference is 35. Work out both numbers. [3 marks]

$$\begin{aligned} \text{difference} &= 9 - 2 = 7 \text{ parts} \\ 7 \text{ parts} &= 35, 1 \text{ part} = 5 \\ 2 \times 5 &= 10 \quad 9 \times 5 = 45 \end{aligned}$$

Answer: _____ 10 and 45 _____

10. Amy and Ben share money in the ratio 5 : 3. Amy gets \$18 more than Ben. Work out the total shared. [3 marks]

$$\begin{aligned} \text{difference} &= 2 \text{ parts} = 18 \\ 1 \text{ part} &= 9 \\ \text{total} &= 8 \text{ parts} = 72 \end{aligned}$$

Answer: _____ £72 _____

11. In a bag the ratio of red to blue counters is 3 : 5. What fraction of the counters are red? [2 marks]

$$\begin{aligned} 3 + 5 &= 8 \text{ parts} \\ \text{fraction is out of the TOTAL, not 3:5} \end{aligned}$$

Answer: _____ $\frac{3}{8}$ _____

12. $\frac{2}{7}$ of a class are left-handed. Write the ratio of left-handed to right-handed students. [2 marks]

$$2 \text{ out of } 7 \text{ left, so } 5 \text{ right}$$

Answer: _____ 2 : 5 _____

13. $a : b = 2 : 3$ and $b : c = 6 : 7$. Work out $a : b : c$. [3 marks]

$$\begin{aligned} \text{make } b \text{ match: } 2:3 &= 4:6 \\ b:c &= 6:7 \text{ already} \\ a:b:c &= 4:6:7 \end{aligned}$$

Answer: _____ 4 : 6 : 7 _____

14. 5 pens cost \$3.50. Work out the cost of 8 pens. [3 marks]

$$\begin{aligned} 1 \text{ pen} &= 3.50 \div 5 = 0.70 \\ 8 \times 0.70 &= 5.60 \end{aligned}$$

Answer: _____ £5.60 _____

15. A recipe for 4 people uses 300 g of rice. Work out the amount needed for 10 people. [3 marks]

$$\begin{aligned} 1 \text{ person} &= 75 \text{ g} \\ 10 \times 75 &= 750 \end{aligned}$$

Answer: _____ 750 _____ g

16. 3 workers build a wall in 8 days. How long would 6 workers take, working at the same rate? [3 marks]

$$\begin{aligned} \text{total work} &= 3 \times 8 = 24 \text{ worker-days} \\ 24 \div 6 &= 4 \\ \text{inverse -- more workers, less time} \end{aligned}$$

Answer: _____ 4 days _____

17. 400 g of cheese costs \$3.20. Work out the cost of 250 g. [3 marks]

$$\begin{aligned} \text{per gram: } 3.20 \div 400 &= 0.008 \\ 250 \times 0.008 &= 2.00 \end{aligned}$$

Answer: _____ £2.00 _____

18. Shop A sells 6 eggs for \$1.50. Shop B sells 10 eggs for \$2.30. Which is better value? Show working. [3 marks]

A: $150 \div 6 = 25p$ each
B: $230 \div 10 = 23p$ each
compare the SAME unit

Answer: Shop B (23p vs 25p each)

19. A recipe for 6 muffins uses 240 g flour and 3 eggs.

(a) Work out the flour needed for 15 muffins.

[3 marks]

1 muffin = 40 g
 $15 \times 40 = 600$ g

(b) Explain why you cannot make exactly 15 muffins with 7 eggs.

[2 marks]

15 muffins need 7.5 eggs
you cannot use half an egg

Answer: _ 600 g ; needs 7.5 eggs _

20. Red and white paint are mixed in the ratio 3 : 2. Sam needs 20 litres of the mixture.

(a) Work out how much red paint he needs.

[3 marks]

5 parts = 20 litres
1 part = 4
red = $3 \times 4 = 12$ litres

(b) Red paint comes in 5 litre tins. How many must he buy?

[2 marks]

$12 \div 5 = 2.4$
round UP: 3 tins

Answer: _____ 12 litres ; 3 tins _____