

WA8MNAUN5

Understanding number

Core + Challenge

Proportional Reasoning with Ratios

I can find unknowns in equivalent ratios and fractions, share in a ratio and scale recipes and maps.

Name: _____ Date: _____ Score: _____ / 58

Key idea

Equivalent ratios: multiply or divide every part by the same number. $3 : 5 = x : 35 \rightarrow 5 \times 7 = 35$, so $x = 3 \times 7 = 21$.

Sharing in a ratio: add the parts, find one part, then multiply. \$60 in $2 : 3 \rightarrow 5$ parts, 1 part = \$12 $\rightarrow$ **\$24 and \$36**.

Unitary method: find the amount for ONE, then scale. 5 pens cost \$8.50 $\rightarrow$ 1 pen \$1.70 $\rightarrow$ 8 pens cost **\$13.60**.

Scale 1 : 50 000 means 1 cm on the map is 50 000 cm = 500 m. Recipe for 4 $\rightarrow$ 6 people: multiply every amount by $\frac{6}{4} = 1.5$.

A Fluency *practise the skill*

/ 16 marks

Work out each answer. 1 mark each.

1. $3 : 5 = x : 20$. x _____

9. Share 60 in the ratio $1 : 2 : 3$ _____

2. $4 : 7 = 20 : x$. x _____

10. 4 kg cost \$10. Cost of 7 kg _____

3. Simplify $18 : 24$ _____

11. 6 pies cost \$27. Cost of 10 _____

4. $\frac{x}{12} = \frac{3}{4}$. x _____

12. Scale 1 : 25 000. 4 cm = ? km _____

5. $\frac{5}{8} = \frac{20}{x}$. x _____

13. $3 : 8 = 15 : x$. x _____

6. Simplify $2.5 : 1.5$ _____

14. $\frac{2}{9} = \frac{x}{63}$. x _____

7. Share \$40 in the ratio $3 : 5$ _____

15. Boys : girls = $4 : 5$. 20 boys; girls? _____

8. Share 72 in the ratio $2 : 7$ _____

16. $x : 6 = 7 : 3$. x _____

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B**Core** *apply the skill to problems*

/ 22 marks

- 1 A cordial is mixed in the ratio cordial : water = 2 : 7. Complete the ratio table by finding A, B and C. [3 marks]

Cordial (mL)	Water (mL)
2	7
40	A
B	63
50	C

Answer: _____

- 2 This recipe serves 4 people. Rewrite the amounts so that it serves 10 people. [2 marks]

Pancakes (serves 4)	Amount
Self-raising flour	1.5 cups
Milk	300 mL
Eggs	2
Sugar	60 g

Answer: _____

- 3 Ava and Ben hire bikes on Rottnest Island and share the \$84 cost in the ratio 3 : 4. How much does each pay? [2 marks]

Answer: _____

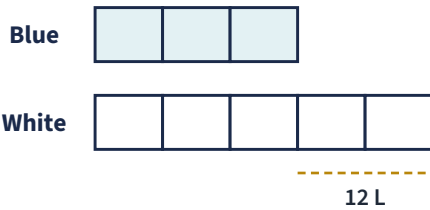
- 4 A map of Kings Park has a scale of 1 : 20 000. [2 marks]
(a) A walking trail is 7.5 cm long on the map. How long is it in real life, in km?
(b) Two lookouts are 2.4 km apart. How far apart are they on the map?

- 5 A car uses 7.2 L of petrol to travel 90 km. At the same rate, how far can it travel on 30 L? [2 marks]

Answer: _____

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- 6 Blue and white paint are mixed in the ratio 3 : 5. The mix contains 12 L more white than blue. [2 marks]
How many litres of paint are there altogether?



Answer: _____

- 7 A netball team played 24 games with no draws. The ratio of wins to losses was 5 : 3. How many more games did they win than lose? [2 marks]

Answer: _____

- 8 A model car is built to a scale of 1 : 18. The model is 26 cm long. How long is the real car, in metres? [2 marks]

Answer: _____

- 9 At a school, $\frac{3}{8}$ of the students catch a Transperth bus. If 240 students catch the bus, how many students attend the school? [2 marks]

Answer: _____

- 10 Concrete is made from cement, sand and gravel in the ratio 1 : 2 : 4. How much of each is needed to make 1.4 m³ of concrete? [3 marks]

Answer: _____

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C**Reasoning** *explain, justify and check*

/ 9 marks

- 1 Jess says, '2 : 3 and 4 : 5 are equivalent ratios, because I added 2 to both parts.' Explain why she is wrong. [2 marks]

- 2 Cordial A is mixed as cordial : water = 3 : 10. Cordial B is mixed 4 : 13. Which drink is stronger (tastes more of cordial)? Show how you decided. [3 marks]

- 3 True or false? 'If $a : b = 3 : 4$, then a is $\frac{3}{4}$ of the total.' Give a reason. [2 marks]

- 4 Explain why, on a map with scale 1 : 50 000, a distance of 2 cm represents 1 km. [2 marks]

D**Challenge** *multi-step and problem-solving*

/ 11 marks

- 1 In a chess club the ratio of boys to girls is 3 : 5. After 6 more boys join (and no girls), the ratio becomes 3 : 4. How many girls are in the club? [3 marks]

Answer: _____

- 2 $a : b = 2 : 3$ and $b : c = 4 : 5$. [3 marks]
(a) Write $a : b : c$ in simplest whole numbers.
(b) If $a + b + c = 175$, find c .

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- 3 Mia and Tom have money in the ratio 5 : 3. Mia gives Tom \$20 and now they have equal amounts. How much did each have at the start? [3 marks]

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Answer: _____

- 4 On a map with scale 1 : 2000, a rectangular park measures 6 cm by 4.5 cm. Find the real area of the park in hectares. (1 ha = 10 000 m²) [2 marks]

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Answer: _____

How did I go?

Fluency ____ / 16 Core ____ / 22 Reasoning ____ / 9 Challenge ____ / 11 **Total ____ / 58**

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