Year 9 ratios worksheet

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Name: _____ Date: _____

Question 1

Runner A completes 10 km in 48 minutes. Runner B runs at 13.5 km/h. Which runner is faster, and by how much (in km/h)?

Answer: _____

Question 2

A landscape architect draws a plan of a rectangular garden using a scale of 1 : 250. On the plan, the garden measures 8 cm long and 5 cm wide. Paving costs $34 per square metre. Find the total cost to pave the entire garden.

Answer: _____

Question 3

A car travels at a constant speed and covers 270 km in 3 hours. A map of the route uses a scale of 1 : 4 000 000. How long, in centimetres correct to 1 decimal place, is the route on the map?

Answer: _____

Question 4

Two brands of olive oil are sold at a supermarket. Brand A costs $6.80 for 500 mL. Brand B costs $9.50 for 750 mL. Find the unit cost of each brand in dollars per 100 mL, and determine which brand is better value.

Answer: _____

Question 5

A map has a scale of 1 : 50,000. Two towns are 4 cm apart on the map. How far apart are they in real life, in kilometres?

Answer: _____

Question 6

Simplify the ratio 24 : 36.

Answer: _____

Question 7

Five notebooks cost $12.50. At the same price per notebook, how much do eight notebooks cost?

Answer: _____

Question 8

Share $480 between Kai and Rosa in the ratio 3 : 5. How much does each person get?

Answer: _____

Question 9

A car travels 270 km in 3 hours. Find its average speed in km/h.

Answer: _____

Question 10

A 750 mL bottle of shampoo costs $4.50 and a 1.25 L bottle costs $7.00. Find the cost per 100 mL of each, and state which is the better buy.

Answer: _____

Year 9 ratios: answers and worked solutions

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Question 1

Key idea: Convert both speeds to the same units before comparing.

1. Convert Runner A's time to hours: 48 min = 48/60 h = 0.8 h 2. Find Runner A's speed: Speed = (10)/(0.8) = 12.5 km/h 3. Compare: Runner B runs at 13.5 km/h and Runner A at 12.5 km/h, so Runner B is faster. 4. Find the difference: 13.5 - 12.5 = 1 km/h

Answer: Runner B is faster by 1 km/h.

Question 2

Key idea: Use the scale factor to convert plan measurements to real measurements, then calculate area and cost.

1. Convert plan dimensions to real dimensions (1 cm on the plan = 250 cm = 2.5 m in real life): Length = 8 × 2.5 = 20 m, Width = 5 × 2.5 = 12.5 m 2. Find the real area: Area = 20 × 12.5 = 250 m² 3. Calculate the cost: Cost = 250 × 34 = 8500

Answer: The total cost to pave the garden is $8500.

Question 3

Key idea: In a scale of 1 : 4 000 000, every 1 cm on the map represents 4 000 000 cm in real life, so real distance (cm) ÷ 4 000 000 = map distance (cm).

1. Find the real distance: the car covers 270 km. 2. Convert to centimetres: 270 km = 270 × 1000 × 100 cm = 27,000,000 cm. 3. Apply the scale: map distance = (27,000,000)/(4,000,000) cm. 4. Calculate: (27,000,000)/(4,000,000) = 6.75 cm. 5. Round to 1 decimal place: 6.75 ≈ 6.8 cm.

Answer: 6.8 cm

Question 4

Key idea: Find each unit cost by dividing the price by the number of units, then compare.

1. Find Brand A's cost per 100 mL: (6.80)/(500) × 100 = $1.36 per 100 mL 2. Find Brand B's cost per 100 mL: (9.50)/(750) × 100 ≈ $1.267 per 100 mL 3. Compare: 1.267 < 1.36, so Brand B has the lower unit cost.

Answer: Brand A costs $1.36 per 100 mL and Brand B costs approximately $1.27 per 100 mL, so Brand B is better value.

Question 5

Answer: 2 km (4 × 50,000 = 200,000 cm)

Question 6

Answer: 2 : 3

Question 7

Answer: $20 ($2.50 each)

Question 8

Answer: Kai $180, Rosa $300

Question 9

Answer: 90 km/h

Question 10

Answer: 750 mL: $0.60 per 100 mL; 1.25 L: $0.56 per 100 mL. The 1.25 L bottle is the better buy.