Direct proportion, rates and scale: 10 practice questions

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Name: _____ Date: _____

Attempt all questions and show your working. Suggested time: 15 to 20 minutes.

Section A: Consolidating (Questions 1-4)

Question 1

Simplify the ratio 24 : 36.

Question 2

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

Question 3

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

Question 4

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

Section B: Standard (Questions 5-10)

Question 5

(a) Ruby is paid by the hour. Is her pay directly proportional to the hours she works? Explain, and if it is, write a rule for pay P (in dollars) in terms of hours h.

Hours worked, h	2	5	8
Pay ($), P	56	140	224

(b) A taxi charges these fares. Is the fare directly proportional to the distance? Explain.

Distance (km)	3	5	8
Fare ($)	10.50	16.50	25.50

Question 6

y is directly proportional to x, and y = 12 when x = 4.

(a) Write a rule for y in terms of x.

(b) Copy and complete the table.

x	1	4	7	10
y		12		

Question 7

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.

Question 8

Convert a speed of 72 km/h to metres per second.

Question 9

A bushwalking map has a scale of 1 : 25,000.

(a) Two campsites are 6.4 cm apart on the map. Find the real distance in kilometres.

(b) A trail is 3 km long in real life. How long is it on the map, in centimetres?

Question 10

A recipe for 4 people uses 300 g of pasta. How much pasta is needed for 10 people?

Direct proportion, rates and scale: answers

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Question 1

Answer: 2 : 3

Question 2

Answer: $20 ($2.50 each)

Question 3

Answer: Kai $180, Rosa $300

Question 4

Answer: 90 km/h

Question 5

Answer: (a) Yes, P/h = 28 every time (and 0 hours gives $0); P = 28h (b) No, the fare per km is not constant ($3.50, $3.30, about $3.19 per km), so there must be a fixed charge as well.

Question 6

Answer: (a) y = 3x (b) 3, 12, 21, 30

Question 7

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.

Question 8

Answer: 20 m/s (72,000 m ÷ 3600 s)

Question 9

Answer: (a) 1.6 km (6.4 × 25,000 = 160,000 cm) (b) 12 cm

Question 10

Answer: 750 g (75 g per person)