Ratios and rates - topic test

Name: _____ Date: _____

15 questions | 40 marks | 45 minutes

A progressive paper covering ratio, unit rates, proportional graphs, journeys and practical models.

No calculator needed.

1. Simplify $24:36$. [1 mark]

2. Complete $3:8=15:\square$. [1 mark]

3. Six kilograms cost AUD 21. Find the price per kilogram. [2 marks]

4. Convert 18 km/h to m/s. [2 marks]

5. Share AUD 84 in the ratio $2:5$. [3 marks]

6. Seven identical notebooks cost AUD 28. Find the cost of eleven. [2 marks]

7. A train travels 126 km in 1.5 h. Find its average speed. [2 marks]

8. Which is cheaper per kilogram: 350 g for AUD 2.80 or 900 g for AUD 6.75? Show both unit prices. [3 marks]

9. Use the table to answer the parts. [4 marks]

Two related quantities

x	y
1	6
3	18
5	30

(a) Show that y is directly proportional to x and write a rule. [2 marks]

(b) Find y when x is 8. [2 marks]

10. A bus travels at 72 km/h for 40 minutes. Find the distance. [2 marks]

11. A drink has water:concentrate $=4:3$. Find each amount in 2.1 L of drink. [3 marks]

12. A tap runs steadily at 4.5 L/min. [3 marks]

(a) How long will it take to supply 63 L? [2 marks]

(b) Express its rate in mL/s. [1 mark]

13. A taxi fare is AUD 5 plus AUD 2 per kilometre. [3 marks]

(a) Explain why fare is not directly proportional to distance. [1 mark]

(b) Find the fare for 12 km. [2 marks]

14. Six workers pack 120 boxes in 2 h. Predict the number packed by 8 workers in 5 h at the same rate per worker. State one assumption. [4 marks]

15. A cyclist rides 20 km at 12 km/h, then another 20 km at 20 km/h, without stopping. [5 marks]

(a) Find the total time. [2 marks]

(b) Find the average speed for the whole trip. [2 marks]

(c) Why is the average speed not $\frac{12+20}{2}$? [1 mark]