FOUNDATION & HIGHER

SAME AT BOTH TIERS

Name ..... Class .....

R11: Compound units

Reason with speed, unit pricing, density and pressure

20 marks · 25 minutes · Calculator allowed

1) Show that travelling 150 km in 2.5 hours is an average speed of 60 km/h.

[Question 1: 1 marks]

2) A car travels 30 km at 60 km/h and then 30 km at 30 km/h. Kai says its average speed is 45 km/h. Explain his mistake and find the average speed.

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[Question 2: 3 marks]

3) Show that the density of a block with mass 600 g and volume 250 cm^3 is 2.4 g/cm^3.

[Question 3: 1 marks]

4) Which is better value: 12 eggs for £2.40 or 30 eggs for £5.70? Show how you decide.

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[Question 4: 2 marks]

5) Show that 72 km/h = 20 m/s.

[Question 5: 2 marks]

6) Explain why snowshoes stop a person from sinking into snow.

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[Question 6: 2 marks]

7) Show that 35 hours at £9.80 per hour earns £343.

[Question 7: 1 marks]

8) Show that it takes 2 hours 30 minutes to travel 225 km at 90 km/h.

[Question 8: 2 marks]

9) Ben says 2 hours 15 minutes is 2.15 hours. Explain his mistake.

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[Question 9: 2 marks]

10) Steel has density 7900 kg/m^3. Show that 3 m^3 of steel has mass 23 700 kg.

[Question 10: 1 marks]

11) Water flows at 15 litres per minute. Show that a 1200-litre tank fills in 80 minutes.

[Question 11: 2 marks]

12) Metal A has mass 120 g and volume 15 cm^3. Metal B has mass 200 g and volume 25 cm^3. Show that they have the same density.

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[Question 12: 1 marks]

End of paper – 20 marks in total

Answers and brief mark scheme

Q	Answer	Method / notes
1	Shown	150 ÷ 2.5 (C1).
2	40 km/h	He averaged the speeds but the times are different (C1); total time 1.5 hours (M1); 60 ÷ 1.5 = 40 (C1).
3	Shown	600 ÷ 250 (C1).
4	30 eggs	20p and 19p each (M1); C1.
5	Shown	72 000 ÷ 3600 (M1); C1.
6	Explanation	Larger area (C1); same force gives less pressure (C1).
7	Shown	35 × 9.8 (C1).
8	Shown	225 ÷ 90 = 2.5 (M1); 0.5 hours = 30 min (C1).
9	2.25 hours	15 minutes is 0.25 of an hour (C1); B1.
10	Shown	7900 × 3 (C1).
11	Shown	1200 ÷ 15 (M1); C1.
12	Both 8 g/cm^3	C1.