Test answers - Ratio, proportion and percentage change

Year: Year 10 · Duration: 45 minutes · /20

Answer to Question 1 (4 marks)

a. $3 : 4$ (1) The HCF of 45 and 60 is 15, so divide both parts by 15. The simplest form is $3 : 4$.
b. $2 + 3 + 7 = 12$ parts (1), $360 \div 12 = 30$ (1), so **£60, £90 and £210** (1) Check: $60 + 90 + 210 = 360$. The shares are £60, £90 and £210.

In (a), dividing by 5 only gives $9 : 12$, which is not the simplest form and scores 0. In (b), a common error is to divide £360 by 3 because there are three people; the ratio has 12 equal parts, and the largest share, £210, belongs to the 7 parts.

Answer to Question 2 (4 marks)

a. 1 kg $= 68$p (1), so 8 kg $=$ **£5.44** (1) Divide £3.40 by 5 to find the cost of 1 kg, then multiply by 8. So 8 kg cost £5.44.
b. Small jar: $160 \div 4 = 40$p per 100 g; large jar $247 \div 6.5 = 38$p per 100 g (1). The **650 g jar** is better value (1) Compare the price per 100 g: the lower price gives more jam for the same money.

Answer to Question 3 (4 marks)

a. $7.2 \times 50\,000 = 360\,000$ cm (1) $=$ **3.6 km** (1) Multiply the map distance by 50 000, then divide by 100 000 to change centimetres into kilometres. The towns are 3.6 km apart.
b. $18\text{ km} = 1\,800\,000$ cm (1), $\div 50\,000 =$ **36 cm** (1) Change kilometres into centimetres, then divide by 50 000. The road is 36 cm long on the map.

A check for (b): 36 cm is five times the distance in (a), and 18 km is five times 3.6 km.

Answer to Question 4 (4 marks)

a. $480 \times 1.2 =$ **£576** (1) Adding 20% VAT gives the multiplier 1.2. The total price is £576.
b. $525 \div 0.7 =$ **£750** (1 for 70%, 1 for the answer) After a 30% reduction the sofa costs 70% of the original, so we divide by 0.7. The original price was £750.
c. $1.12 \times 0.88 = 0.9856 < 1$ (1) The overall multiplier is less than 1, so the result is smaller than the original number.

Answer to Question 5 (4 marks)

a. $7k - 4k = 12$ (1), $k = 4$ (1) The difference between the ages is $7k - 4k = 3k$, and this equals 12 years. So $k = 4$.

b. **16 and 28** (1) Substitute $k = 4$: the cousins are $4 \times 4 = 16$ and $7 \times 4 = 28$ years old.

c. $\frac{16 + n}{28 + n} = \frac{5}{8}$, $128 + 8n = 140 + 5n$, $3n = 12$, so **4 years** (1) Both ages increase by n years. Cross-multiply, then solve. Check: $20 : 32 = 5 : 8$.

In (a), check that $28 - 16 = 12$ years. In (c), $16 + 4 = 20$ and $28 + 4 = 32$, and dividing both by 4 gives $5 : 8$.