1.7 Ratio and proportion

Name: _____ Class: _____ Date: _____ **Total: 20 marks**

KEY WORDS ratio • direct proportion

Ratio and proportion

Objective

Simplify ratios, share quantities in given ratios, and use direct proportion with the unitary method in word problems (objectives Foundation 1.7 A–E).

1 Key knowledge and worked examples

Ratio. Simplify by dividing through: $45 : 60 = 3 : 4$. Share by $\frac{\text{parts}}{\text{total}} \times$ amount: £350 in $2 : 5$ gives $\frac{2}{7} \times 350 =$ £100 and $\frac{5}{7} \times 350 =$ £250.

Proportion. The unitary method finds one unit first: 7 pens cost £4.20, so one pen £0.60 and 12 pens £7.20. Direct proportion scales both ways ($y = kx$); check the answer is sensible.

2 Practice

2.1 Simplify $45 : 60$ [1]

2.2 Share £350 in the ratio $2 : 5$ [3]

2.3 Simplify $\frac{3}{4} : 2$ (ratio of fractions) [2]

2.4 5 identical buses seat 225 people. How many do 8 buses seat? [2]

3 Exam-style questions

3.1 *(Original.)* A alloy is copper and zinc in the ratio $7 : 3$. A block weighs 950 g. (a) Find the mass of copper. (b) A second block has 273 g of zinc: find its total mass. [4]

3.2 *(Original.)* A recipe for 4 people uses 150 g of flour. (a) How much flour for 10 people? (b) With 525 g of flour available, how many whole people can be fed? [4]

3.3 *(Original.)* y is directly proportional to x; $y = 21$ when $x = 7$. (a) Find the equation. (b) Find y when $x = 12$. (c) Find x when $y = 45$. [4]

Solutions

2.1 $3:4$.

2.2 £100 and £250.

2.3 Multiply both by 4: $3:8$.

2.4 $225 \div 5 = 45$ per bus; $8 \times 45 = 360$ people.

3.1 (a) Copper $= \frac{7}{10} \times 950 = 665$ g. (b) Zinc is $\frac{3}{10}$ of total: total $= 273 \div \frac{3}{10} = 910$ g.

3.2 (a) $150 \times \frac{10}{4} = 375$ g. (b) $525 \div 37.5 = 14$ people.

3.3 (a) $y = kx$: $21 = 7k$ so $k = 3$, $y = 3x$. (b) $y = 36$. (c) $x = 15$.

Local review guidance: total parts found before sharing; exact amounts with units; proportion answers checked against the direction of change. This is authored classroom guidance.