



EP.M104 Scaling Recipes and Quantities by Ratio

GL ASSESSMENT GL-11PLUS-MATHS · Calculators not allowed · about 55 minutes

Total Marks

Name: _____ Date: ____ / ____ / ____

Answer ALL questions. Show all your working.

- 1** A biscuit recipe makes 12 biscuits using 150 g sugar. Calculate how much sugar is needed for 6 biscuits.

(Total for Question 1 is 1 mark)

- 2** A cake recipe serves 4 people and uses 240 g plain flour. The baker wants to make the cake for 10 people. Work out how much plain flour the baker should use.

(Total for Question 2 is 2 marks)

- 3** In a cake mix the ratio of milk to flour is 2:5. A baker uses 350 g of flour. Calculate how much milk should be used.

(Total for Question 3 is 2 marks)

- 4** An iced bun recipe makes 6 buns using 180 g butter and 240 g sugar. The cook wants to make 9 buns. Work out how much butter and how much sugar are needed.

(a) Butter required for 9 buns. (1)

(b) Sugar required for 9 buns. (2)

(Total for Question 4 is 3 marks)

- 5 A smoothie recipe is doubled to make 8 portions and the doubled recipe uses 600 ml orange juice. (a) What was the original number of portions? (b) How much orange juice was in each portion of the original recipe?

(a) Original number of portions. (1)

(b) Orange juice per portion in the original recipe. (1)

(Total for Question 5 is 2 marks)

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- 6 A soup recipe uses $\frac{3}{4}$ litre of stock to make 5 bowls. What is the scale factor to make 15 bowls?

- ☐ A) $\frac{1}{3}$
☐ B) 2
☐ C) 3
☐ D) 9
☐ E) 45

(Total for Question 6 is 1 mark)

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- 7 A pancake batter uses 250 g plain flour to make 7 pancakes. Calculate how much plain flour is needed to make 13 pancakes. Give your answer to the nearest gram.

(Total for Question 7 is 3 marks)

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- 8 A salad dressing has oil:vinegar in the ratio 3:1. The recipe for 4 portions uses 120 ml oil. If the cook wants 10 portions, calculate how much vinegar is needed.

(Total for Question 8 is 2 marks)

9 A muffin recipe makes 20 muffins using 320 g flour, 200 g sugar and 4 eggs. The cook wants to make 15 muffins. (a) How much flour is needed? (b) How much sugar is needed? (c) How many eggs are needed?

(a) Flour required for 15 muffins. (1)

(b) Sugar required for 15 muffins. _____ (1)

(c) Eggs required for 15 muffins. _____ (2)

(Total for Question 9 is 4 marks)

10 A catering company uses a recipe for 25 portions that requires 2 kg chicken, 1.5 kg rice and 400 g spice mix. They need to prepare 160 portions for an event. (a) What is the scale factor? (b) How much chicken is required? (c) How much rice is required? (d) How much spice mix is required, in grams? (e) If the spice mix is sold in 250 g jars, how many jars should they buy?

(a) Scale factor from 25 to 160 portions. (1)

(b) Chicken required for 160 portions. (2)

(c) Rice required for 160 portions. _____ (2)

(d) Spice mix required for 160 portions, in grams. _____ (1)

(e) Number of 250 g jars of spice mix to buy. _____ (2)

(Total for Question 10 is 8 marks)

- 11** A bakery recipe for 12 scones uses 700 g flour, 300 ml milk and 100 g sugar in the ratio 7:3:1. The baker decides to make 30 scones and uses 6,000 g flour. (a) What is the scale factor from 12 to 30 scones? (b) Using that scale factor, calculate how much milk and sugar are required. (c) Does 6,000 g flour match the required amount? Show working.

(a) Scale factor from 12 to 30 scones. (1)

(b) Milk and sugar required for 30 scones. (3)

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(c) Compare the baker's 6,000 g flour with the required amount and state the difference. (2)

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(Total for Question 11 is 6 marks)

- 12** A caterer prepares two sauces. Sauce A, for 10 portions, needs 240 ml cream and 80 g cheese. Sauce B, for 6 portions, needs 150 ml cream and 50 g cheese. The caterer must prepare 99 portions total, split in the ratio $A:B = 5:4$. Work out: (a) how many portions of A and B are needed; (b) total cream required (in ml); (c) total cheese required (in grams); (d) how many 2-litre cream cartons are needed; (e) how many 500 g blocks of cheese are needed; (f) if the caterer instead doubles recipe A and triples recipe B, how many portions would that make and would it be enough for 99 portions?

(a) How many portions of A and B are required? (2)

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(b) How much cream is needed in total (in ml)? (3)

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(c) How much cheese is needed in total (in grams)? (3)

.....
(d) How many 2-litre cream cartons are needed? (2)

.....
(e) How many 500 g blocks of cheese are needed? (2)

.....
(f) If the caterer doubles recipe A and triples recipe B, how many portions would that make and would it be enough for 99 portions? (2)

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(Total for Question 12 is 14 marks)

Mark scheme · EP.M104 Scaling Recipes and Quantities by Ratio

Question 1

- **B1** 75 g cao
- **Answer: 75 g**

Question 2

- **M1** $240 \times (10/4)$ or equivalent method shown
- **A1** 600 g plain flour cao
- **Answer: 600 g**

Question 3

- **M1** milk = $2/5 \times 350$ or equivalent method shown
- **A1** 140 g (or ml) milk cao
- **Answer: 140 g (or ml)**

Question 4

- (a) **dM1** scale factor $9/6 = 1.5$ seen ft
- (a) **Answer: 270 g**
- (b) **M1** correct scaling of sugar: 240×1.5 or equivalent
- (b) **A1** 360 g cao
- (b) **Answer: 360 g**

Question 5

- (a) **B1** 4 portions cao
- (a) **Answer: 4 portions**
- (b) **A1** 75 ml cao
- (b) **Answer: 75 ml**

Question 6

- **B1** correct option C (3) cao
- **Answer: C) 3 (because $15/5 = 3$). The other options show common slips: A) dividing instead of multiplying; B) doubling; D) squaring the factor; E) multiplying both numbers.**

Question 7

- **M1** method: $250 \times (13/7)$ or equivalent shown
- **M1** multiplication $250 \times 13 = 3250$ or equivalent seen
- **A1** 464 g cao ($3250/7 = 464.2857...$ rounds to 464 g)
- **Answer: 464 g**

Question 8

- **M1** scale factor $10/4 = 2.5$ or equivalent method seen (use ft)
- **A1** 100 ml vinegar cao (oil scaled to $120 \times 2.5 = 300$ ml, vinegar = $1/3$ of oil = 100 ml)
- **Answer: 100 ml vinegar (since oil = $120 \times 2.5 = 300$ ml, ratio 3:1 gives vinegar = $300/3 = 100$ ml).**

Question 9

- (a) **B1** 240 g cao ($320 \times 15/20 = 240$)
- (a) **Answer: 240 g**
- (b) **B1** 150 g cao ($200 \times 15/20 = 150$)
- (b) **Answer: 150 g**
- (c) **M1** method: eggs = $4 \times (15/20)$ or equivalent
- (c) **A1** 3 eggs cao
- (c) **Answer: 3 eggs**

Question 10

- (a) **B1** 6.4 cao ($160/25 = 6.4$)
- **(a) Answer: 6.4**
- (b) **M1** method: 2×6.4 or equivalent
- (b) **A1** 12.8 kg cao
- **(b) Answer: 12.8 kg**
- (c) **M1** method: 1.5×6.4 or equivalent
- (c) **A1** 9.6 kg cao
- **(c) Answer: 9.6 kg**
- (d) **B1** 2,560 g cao ($400 \text{ g} \times 6.4 = 2560 \text{ g}$)
- **(d) Answer: 2,560 g**
- (e) **M1** method: $2560 / 250$ seen or equivalent
- (e) **A1** 11 jars cao ($2560/250 = 10.24$ so round up to 11)
- **(e) Answer: 11 jars**

Question 11

- (a) **B1** 2.5 cao ($30/12 = 2.5$)
- **(a) Answer: 2.5**
- (b) **M1** method: multiply original amounts by 2.5 (300×2.5 and 100×2.5) or equivalent
- (b) **M1** correct intermediate: $300 \times 2.5 = 750$, $100 \times 2.5 = 250$ seen
- (b) **A1** 750 ml milk and 250 g sugar cao
- **(b) Answer: 750 ml milk and 250 g sugar**
- (c) **M1** calculate required flour = $700 \times 2.5 = 1,750 \text{ g}$ or equivalent
- (c) **A1** No; 6,000 g is too much by 4,250 g cao
- **(c) Answer: Required flour = 1,750 g. 6,000 g is 4,250 g too much.**

Question 12

- (a) **M1** partition 99 into 9 parts ($5+4$) or equivalent method
- (a) **A1** 55 portions of A and 44 portions of B cao
- **(a) Answer: A: 55 portions, B: 44 portions**
- (b) **M1** calculate cream for A: $240/10 = 24 \text{ ml}$ per portion or 240×5.5 for 55 portions seen
- (b) **M1** calculate cream for B: $150/6 = 25 \text{ ml}$ per portion or $150 \times (44/6)$ seen
- (b) **A1** 2,420 ml cao (1,320 ml for A and 1,100 ml for B)
- **(b) Answer: 2,420 ml**
- (c) **M1** cheese for A: $80/10 = 8 \text{ g}$ per portion then $8 \times 55 = 440 \text{ g}$ seen
- (c) **M1** cheese for B: $50/6$ per portion then $(50/6) \times 44 = 366 \frac{2}{3} \text{ g}$ seen
- (c) **A1** $806 \frac{2}{3} \text{ g}$ (or 806.67 g) cao
- **(c) Answer: $806 \frac{2}{3} \text{ g}$ (approximately 806.67 g)**
- (d) **M1** method: $2,420 \text{ ml} / 2,000 \text{ ml}$ seen
- (d) **A1** 2 cartons cao (2,420 ml needs 2 cartons)
- **(d) Answer: 2 cartons**
- (e) **M1** method: $806 \frac{2}{3} \text{ g} / 500 \text{ g}$ seen
- (e) **A1** 2 blocks cao ($806 \frac{2}{3} \text{ g}$ requires 2 blocks)
- **(e) Answer: 2 blocks**
- (f) **M1** method: doubled A = $10 \times 2 = 20$ portions? (use base portions 10 and 6 appropriately) and tripled B = $6 \times 3 = 18$ seen
- (f) **A1** Total 38 portions so not enough cao
- **(f) Answer: 38 portions, not enough for 99 portions**