2.81 Scaling Recipes and Quantities by Ratio: Test Pack

GL ASSESSMENT GL-11PLUS-MATHS · Calculators not allowed · about 60 minutes

Total Marks

Name: _____ Date: ____ / ____ / _____

Answer ALL questions. Show all your working.

1 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.

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

.....

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

.....

(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)**

.....

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(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)**

.....

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

(1)

3 A recipe for soup serves 10 people. It uses 50 g of stock and 230 g of sugar. Ethan makes it for 17 people. What is the total mass of stock and sugar needed?

- ☐ A) 4,760 g
- ☐ B) 315 g
- ☐ C) 287 g
- ☐ D) 476 g
- ☐ E) 441 g

4 A recipe for muffin mix serves 8 people. It uses 80 g of sugar and 56 g of sugar. Ffion makes it for 12 people. What is the total mass of sugar and sugar needed?

- ☐ A) 164 g
- ☐ B) 120 g
- ☐ C) 204 g
- ☐ D) 176 g
- ☐ E) 140 g

5 A recipe for rice pudding serves 12 people and uses 480 ml of milk. Oliver wants to make it for 11 people. How much milk is needed?

- ☐ A) 40 ml
- ☐ B) 479 ml
- ☐ C) 5,280 ml
- ☐ D) 441 ml
- ☐ E) 440 ml

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6 A recipe for soup serves 12 people. It uses 60 g of stock and 36 g of sugar. Harry makes it for 28 people. What is the total mass of stock and sugar needed?

- [ ] A) 112 g
- [ ] B) 144 g
- [ ] C) 2,688 g
- [ ] D) 224 g
- [ ] E) 176 g

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7 Maya mixes concrete using cement and sand in the ratio 8:5. Maya uses 80 kg of cement. How much sand does Maya use?

- [ ] A) 49 kg
- [ ] B) 400 kg
- [ ] C) 77 kg
- [ ] D) 51 kg
- [ ] E) 50 kg

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8 Callum mixes a trail mix using nuts and raisins in the ratio 4:3. Callum uses 16 g of nuts. How much raisins does Callum use?

- [ ] A) 12 g
- [ ] B) 28 g
- [ ] C) 11 g
- [ ] D) 48 g
- [ ] E) 15 g

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9 A recipe for scone mix serves 10 people and uses 100 g of self-raising flour. Yusuf wants to make it for 30 people. How much self-raising flour is needed?

- [ ] A) 299 g
- [ ] B) 301 g
- [ ] C) 3,000 g
- [ ] D) 120 g
- [ ] E) 300 g

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10 Hamza mixes compost using soil and sand in the ratio 7:4. Hamza uses 35 kg of soil. How much sand does Hamza use?

- [ ] A) 32 kg
- [ ] B) 21 kg
- [ ] C) 20 kg
- [ ] D) 140 kg
- [ ] E) 19 kg

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11 Ravi mixes paint using red and white in the ratio 2:9. Ravi uses 18 ml of red. How much more white than red does Ravi use?

- [ ] A) 25 ml
- [ ] B) 99 ml
- [ ] C) 63 ml
- [ ] D) 9 ml
- [ ] E) 162 ml

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12 A recipe for muffin mix serves 10 people. It uses 400 g of sugar and 80 g of sugar. Poppy makes it for 17 people. What is the total mass of sugar and sugar needed?

- [ ] A) 815 g
- [ ] B) 680 g
- [ ] C) 536 g
- [ ] D) 816 g
- [ ] E) 760 g

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13 Ben mixes a trail mix using nuts and raisins in the ratio 1:6. Ben uses 5 g of nuts. How much raisins does Ben use?

- [ ] A) 5 g
- [ ] B) 30 g
- [ ] C) 35 g
- [ ] D) 25 g
- [ ] E) 10 g

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14 A recipe for muffin mix serves 12 people and uses 120 g of sugar. Yusuf wants to make it for 9 people. How much sugar is needed?

- ☐ A) 10 g
- ☐ B) 160 g
- ☐ C) 117 g
- ☐ D) 1,080 g
- ☐ E) 90 g

---

15 A recipe for biscuit dough serves 5 people and uses 125 g of butter. Poppy wants to make it for 15 people. How much butter is needed?

- ☐ A) 135 g
- ☐ B) 1,250 g
- ☐ C) 374 g
- ☐ D) 1,875 g
- ☐ E) 375 g

---

16 Ravi mixes concrete using cement and sand in the ratio 7:2. Ravi uses 14 kg of cement. How much sand does Ravi use?

- ☐ A) 4 kg
- ☐ B) 3 kg
- ☐ C) 49 kg
- ☐ D) 9 kg
- ☐ E) 28 kg

---

17 Sana mixes a smoothie using banana and yogurt in the ratio 2:1. Sana uses 16 g of banana. How much yogurt does Sana use?

- ☐ A) 9 g
- ☐ B) 8 g
- ☐ C) 32 g
- ☐ D) 15 g
- ☐ E) 16 g

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18 Noah mixes a smoothie using banana and yogurt in the ratio 7:9. Noah uses 56 g of banana. How much more yogurt than banana does Noah use?

- [ ] A) 17 g
- [ ] B) 58 g
- [ ] C) 8 g
- [ ] D) 504 g
- [ ] E) 16 g

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19 A recipe for lemonade serves 2 people and uses 60 ml of water. Priya wants to make it for 4 people. How much water is needed?

- [ ] A) 120 ml
- [ ] B) 121 ml
- [ ] C) 119 ml
- [ ] D) 62 ml
- [ ] E) 240 ml

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20 Amara mixes compost using soil and sand in the ratio 7:2. Amara uses 77 kg of soil. How much sand does Amara use?

- [ ] A) 72 kg
- [ ] B) 22 kg
- [ ] C) 154 kg
- [ ] D) 21 kg
- [ ] E) 55 kg

---

21 A recipe for pancake batter serves 6 people. It uses 60 g of flour and 18 g of sugar. Kofi makes it for 21 people. What is the total mass of flour and sugar needed?

- [ ] A) 1,638 g
- [ ] B) 228 g
- [ ] C) 210 g
- [ ] D) 273 g
- [ ] E) 123 g

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22 A recipe for pasta sauce serves 2 people and uses 20 g of chopped tomatoes. Noah wants to make it for 18 people. How much chopped tomatoes is needed?

- [ ] A) 180 g
- [ ] B) 36 g
- [ ] C) 181 g
- [ ] D) 360 g
- [ ] E) 10 g

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23 Callum mixes compost using soil and sand in the ratio 4:1. Callum uses 20 kg of soil. How much sand does Callum use?

- [ ] A) 15 kg
- [ ] B) 5 kg
- [ ] C) 4 kg
- [ ] D) 20 kg
- [ ] E) 17 kg

---

24 A recipe for scone mix serves 5 people and uses 100 g of self-raising flour. Kofi wants to make it for 20 people. How much self-raising flour is needed?

- [ ] A) 400 g
- [ ] B) 20 g
- [ ] C) 2,000 g
- [ ] D) 115 g
- [ ] E) 399 g

---

25 A recipe for lemonade serves 6 people. It uses 30 g of water and 60 g of sugar. Niamh makes it for 20 people. What is the total mass of water and sugar needed?

- [ ] A) 104 g
- [ ] B) 230 g
- [ ] C) 300 g
- [ ] D) 100 g
- [ ] E) 160 g

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26 A recipe for lemonade serves 10 people and uses 100 ml of water. Callum wants to make it for 5 people. How much water is needed?

- [ ] A) 200 ml
- [ ] B) 500 ml
- [ ] C) -500 ml
- [ ] D) 50 ml
- [ ] E) 95 ml

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27 Ben mixes paint using red and white in the ratio 7:3. Ben uses 42 ml of red. How much white does Ben use?

- [ ] A) 6 ml
- [ ] B) 18 ml
- [ ] C) 126 ml
- [ ] D) 98 ml
- [ ] E) 38 ml

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28 Amara mixes concrete using cement and sand in the ratio 3:1. Amara uses 30 kg of cement. How much concrete does Amara make altogether?

- [ ] A) 30 kg
- [ ] B) 90 kg
- [ ] C) 40 kg
- [ ] D) 28 kg
- [ ] E) 39 kg

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29 A recipe for biscuit dough serves 10 people. It uses 100 g of butter and 40 g of sugar. Ethan makes it for 9 people. What is the total mass of butter and sugar needed?

- [ ] A) 126 g
- [ ] B) 127 g
- [ ] C) 139 g
- [ ] D) 130 g
- [ ] E) 136 g

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30 A recipe for rice pudding serves 12 people and uses 180 ml of milk. Isla wants to make it for 28 people. How much milk is needed?

- [ ] A) 420 ml
- [ ] B) 421 ml
- [ ] C) 5,040 ml
- [ ] D) 419 ml
- [ ] E) 196 ml

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31 A soup recipe uses 3/4 litre of stock to make 5 bowls. What is the scale factor to make 15 bowls?

- [ ] A) 1/3
- [ ] B) 2
- [ ] C) 3
- [ ] D) 9
- [ ] E) 45

---

32 Esme mixes a trail mix using nuts and raisins in the ratio 7:3. Esme uses 35 g of nuts. How much more nuts than raisins does Esme use?

- [ ] A) 50 g
- [ ] B) 31 g
- [ ] C) 105 g
- [ ] D) 20 g
- [ ] E) 15 g

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33 Niamh mixes paint using red and white in the ratio 4:3. Niamh uses 40 ml of red. How much white does Niamh use?

- [ ] A) 10 ml
- [ ] B) 39 ml
- [ ] C) 29 ml
- [ ] D) 120 ml
- [ ] E) 30 ml

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34 Kofi mixes squash using juice and water in the ratio 7:4. Kofi uses 21 ml of juice. How much water does Kofi use?

- [ ] A) 9 ml
- [ ] B) 12 ml
- [ ] C) 18 ml
- [ ] D) 84 ml
- [ ] E) 11 ml

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35 Ravi mixes a trail mix using nuts and raisins in the ratio 1:6. Ravi uses 7 g of nuts. How much raisins does Ravi use?

- [ ] A) 7 g
- [ ] B) 42 g
- [ ] C) 49 g
- [ ] D) 35 g
- [ ] E) 12 g

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36 Jack mixes paint using red and white in the ratio 8:1. Jack uses 40 ml of red. How much white does Jack use?

- [ ] A) 35 ml
- [ ] B) 33 ml
- [ ] C) 40 ml
- [ ] D) 5 ml
- [ ] E) 4 ml

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37 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? **(1)**

(b) Using that scale factor, calculate how much milk and sugar are required for 30 scones. **(3)**

(c) Does 6,000 g flour match the required amount? Show working and state the difference. **(2)**

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38 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)**

.....

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39 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)**

.....

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Mark scheme · 2.81 Scaling Recipes and Quantities by Ratio: Test Pack

A correct answer earns full marks unless the question asks for working, a method, proof or explanation.

Question 1

(a) partition 99 into 9 parts (5+4) or equivalent method **M1**

(a) 55 portions of A and 44 portions of B cao **A1**

(a) Answer: A: 55 portions, B: 44 portions

(b) calculate cream for A: 240/10 = 24 ml per portion or 240 x 5.5 for 55 portions seen **M1**

(b) calculate cream for B: 150/6 = 25 ml per portion or 150 x (44/6) seen **M1**

(b) 2,420 ml cao (1,320 ml for A and 1,100 ml for B) **A1**

(b) Answer: 2,420 ml

(c) cheese for A: 80/10 = 8 g per portion then 8 x 55 = 440 g seen **M1**

(c) cheese for B: 50/6 per portion then (50/6) x 44 = 366 2/3 g seen **M1**

(c) 806 2/3 g (or 806.67 g) cao **A1**

(c) Answer: 806 2/3 g (approximately 806.67 g)

(d) method: 2,420 ml / 2,000 ml seen **M1**

(d) 2 cartons cao (2,420 ml needs 2 cartons) **A1**

(d) Answer: 2 cartons

(e) method: 806 2/3 g / 500 g seen **M1**

(e) 2 blocks cao (806 2/3 g requires 2 blocks) **A1**

(e) Answer: 2 blocks

(f) method: doubled A = 10 x 2 = 20 portions? (use base portions 10 and 6 appropriately) and tripled B = 6 x 3 = 18 seen **M1**

(f) Total 38 portions so not enough cao **A1**

(f) Answer: 38 portions, not enough for 99 portions

Question 2

75 g cao **B1**

Answer: 75 g

Question 3

correct option D (476 g) cao; scale factor 17/10 applied to the amount **B1**

Answer: D) 476 g

Question 4

correct option C (204 g) cao; scale factor 12/8 applied to the amount **B1**

Answer: C) 204 g

Question 5

correct option E (440 ml) cao; scale factor 11/12 applied to the amount **B1**

Answer: E) 440 ml

Question 6

correct option D (224 g) cao; scale factor 28/12 applied to the amount **B1**

Answer: D) 224 g

Question 7

correct option E (50 kg) cao; 80 / 8 = 10 per part **B1**

Answer: E) 50 kg

Question 8

correct option A (12 g) cao; 16 / 4 = 4 per part **B1**

Answer: A) 12 g

Question 9

correct option E (300 g) cao; scale factor 30/10 applied to the amount **B1**

Answer: E) 300 g

Question 10

correct option C (20 kg) cao; 35 / 7 = 5 per part **B1**

Answer: C) 20 kg

Question 11

correct option C (63 ml) cao; 18 / 2 = 9 per part **B1**

Answer: C) 63 ml

Question 12

correct option D (816 g) cao; scale factor 17/10 applied to the amount **B1**

Answer: D) 816 g

Question 13

correct option B (30 g) cao; 5 / 1 = 5 per part **B1**

Answer: B) 30 g

Question 14

correct option E (90 g) cao; scale factor 9/12 applied to the amount **B1**

Answer: E) 90 g

Question 15

correct option E (375 g) cao; scale factor 15/5 applied to the amount **B1**

Answer: E) 375 g

Question 16

correct option A (4 kg) cao; 14 / 7 = 2 per part **B1**

Answer: A) 4 kg

Question 17

correct option B (8 g) cao; 16 / 2 = 8 per part **B1**

Answer: B) 8 g

Question 18

correct option E (16 g) cao; 56 / 7 = 8 per part **B1**

Answer: E) 16 g

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Question 19

correct option A (120 ml) cao; scale factor 4/2 applied to the amount **B1**

Answer: A) 120 ml

Question 20

correct option B (22 kg) cao; 77 / 7 = 11 per part **B1**

Answer: B) 22 kg

Question 21

correct option D (273 g) cao; scale factor 21/6 applied to the amount **B1**

Answer: D) 273 g

Question 22

correct option A (180 g) cao; scale factor 18/2 applied to the amount **B1**

Answer: A) 180 g

Question 23

correct option B (5 kg) cao; 20 / 4 = 5 per part **B1**

Answer: B) 5 kg

Question 24

correct option A (400 g) cao; scale factor 20/5 applied to the amount **B1**

Answer: A) 400 g

Question 25

correct option C (300 g) cao; scale factor 20/6 applied to the amount **B1**

Answer: C) 300 g

Question 26

correct option D (50 ml) cao; scale factor 5/10 applied to the amount **B1**

Answer: D) 50 ml

Question 27

correct option B (18 ml) cao; 42 / 7 = 6 per part **B1**

Answer: B) 18 ml

Question 28

correct option C (40 kg) cao; 30 / 3 = 10 per part **B1**

Answer: C) 40 kg

Question 29

correct option A (126 g) cao; scale factor 9/10 applied to the amount **B1**

Answer: A) 126 g

Question 30

correct option A (420 ml) cao; scale factor 28/12 applied to the amount **B1**

Answer: A) 420 ml

Question 31

correct option C (3) cao **B1**

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 32

correct option D (20 g) cao; 35 / 7 = 5 per part **B1**

Answer: D) 20 g

Question 33

correct option E (30 ml) cao; 40 / 4 = 10 per part **B1**

Answer: E) 30 ml

Question 34

correct option B (12 ml) cao; 21 / 7 = 3 per part **B1**

Answer: B) 12 ml

Question 35

correct option B (42 g) cao; 7 / 1 = 7 per part **B1**

Answer: B) 42 g

Question 36

correct option D (5 ml) cao; 40 / 8 = 5 per part **B1**

Answer: D) 5 ml

Question 37

(a) 2.5 cao (30/12 = 2.5) **B1**

(a) Answer: 2.5

(b) method: multiply original amounts by 2.5 (300 x 2.5 and 100 x 2.5) or equivalent **M1**

(b) correct intermediate: 300 x 2.5 = 750, 100 x 2.5 = 250 seen **M1**

(b) 750 ml milk and 250 g sugar cao **A1**

(b) Answer: 750 ml milk and 250 g sugar

(c) calculate required flour = 700 x 2.5 = 1,750 g or equivalent **M1**

(c) No; 6,000 g is too much by 4,250 g cao **A1**

(c) Answer: Required flour = 1,750 g. 6,000 g is 4,250 g too much.

Question 38

(a) scale factor 9/6 = 1.5 seen ft **dM1**

(a) Answer: 270 g

(b) correct scaling of sugar: 240 x 1.5 or equivalent **M1**

(b) 360 g cao **A1**

(b) Answer: 360 g

Question 39

(a) 240 g cao (320 x 15/20 = 240) **B1**

(a) Answer: 240 g

(b) 150 g cao (200 x 15/20 = 150) **B1**

(b) Answer: 150 g

(c) method: eggs = 4 x (15/20) or equivalent **M1**

(c) 3 eggs cao **A1**

(c) Answer: 3 eggs

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