



3.6D Proportion: Fluency and Exam Drill

EDEXCEL Edexcel 1MA1 · Calculator allowed · about 50 minutes

Total Marks

Name: _____ Date: ____ / ____ / ____

Answer ALL questions. Show all your working.

- 1 Work out $\frac{2}{5}$ of 75.

(Total for Question 1 is 1 mark)

- 2 A pack of 6 pens costs £3.48. Work out the cost of 1 pen.

(Total for Question 2 is 1 mark)

- 3 A factory uses 9 metres of fabric to make 6 shirts. Work out the length of fabric needed for 1 shirt.

(Total for Question 3 is 1 mark)

- 4 Priya uses 300 g of sugar to make 24 cupcakes. Work out how much sugar she needs to make 10 cupcakes.

(Total for Question 4 is 2 marks)

- 5 A paint covers 18 m^2 with 3 litres. How many litres are needed to cover 25 m^2 ? Give your answer to 2 decimal places.

(Total for Question 5 is 2 marks)

- 6** A recipe for 8 people uses 480 g of flour. Find the amount of flour needed for 5 people.

(Total for Question 6 is 2 marks)

- 7** Which is better value: Pack A, 750 g cheese for £4.50, or Pack B, 500 g cheese for £3.20? Show your working.

(Total for Question 7 is 2 marks)

- 8** A car travels 210 miles in 3 hours. At the same speed how far will it travel in 7 hours?

(Total for Question 8 is 2 marks)

- 9** A cake recipe for 6 people uses 125 g butter. Work out the amount of butter needed to make the cake for 9 people.

(Total for Question 9 is 3 marks)

- 10** 250 g of coffee beans cost £2.50. How many grams can be bought with £45? Give your answer in grams and in kilograms.

(Total for Question 10 is 3 marks)

11 y is directly proportional to x . Given $y = 15$ when $x = 3$, find y when $x = 7$.

(Total for Question 11 is 2 marks)

12 A paint mixture uses blue:white in the ratio 3:5. If a total of 40 litres is mixed, work out the volume of blue paint used.

(Total for Question 12 is 2 marks)

13 A supermarket sells oats as follows: 750 g tub for £1.80, 1.2 kg bag for £2.92 and a 100 g pack for £0.25.

(a) Work out the price per kg for the 750 g tub and the 1.2 kg bag. (2 marks)

(b) Which is best value per kg? Give a reason. (1 mark)

(c) Ellie needs exactly 2.5 kg of oats. Find the cheapest combination of the given packs that gives at least 2.5 kg and give the total cost. (2 marks)

(a) (a) Work out the price per kg for the 750 g tub and the 1.2 kg bag. (2)

(b) (b) Which is best value per kg? Give a reason. (1)

(c) (c) Find the cheapest combination of the given packs that gives at least 2.5 kg and give the total cost. (2)

(Total for Question 13 is 5 marks)

- 14** Show that a smoothie recipe for 4 people using 360 ml milk and 120 g banana would need 990 ml milk and 330 g banana to serve 11 people.

(Total for Question 14 is 4 marks)

- 15** A cake recipe uses 250 ml milk to make 5 slices. Milk costs £0.84 per litre. How much will the milk cost to make 14 slices? Give your answer to the nearest penny.

(Total for Question 15 is 4 marks)

- 16** A cafe makes milkshakes. Each shake uses 200 ml milk, 50 g sugar and 100 g fruit. Costs are: milk £0.65 per litre, sugar £0.80 per kg, fruit £2.40 per kg.

(a) Calculate the cost of ingredients for one shake, giving your answer to the nearest penny. (3 marks)

(b) The cafe sells each shake for £2.20. Calculate the profit made from selling 5 shakes. Give your answer to the nearest penny. (3 marks)

(a) (a) Calculate the cost of ingredients for one shake, giving your answer to the nearest penny. (3)

(b) (b) The cafe sells each shake for £2.20. Calculate the profit made from selling 5 shakes. Give your answer to the nearest penny. (3)

(Total for Question 16 is 6 marks)

Mark scheme · 3.6D Proportion: Fluency and Exam Drill

Question 1

- **B1** 30 cao
- **Answer: 30** ($2/5$ of 75 = $75 \times 2/5 = 150/5 = 30$).

Question 2

- **B1** £0.58 cao
- **Answer: £0.58** ($3.48 / 6 = 0.58$).

Question 3

- **B1** 1.5 metres cao
- **Answer: 1.5 m** ($9 \text{ m} / 6 = 1.5 \text{ m}$).

Question 4

- **M1** find sugar per cupcake: $300/24$ oe
- **A1** 125 g cao
- **Answer: 125 g** ($300 \text{ g} / 24 = 12.5 \text{ g per cupcake}$; $12.5 \text{ g} \times 10 = 125 \text{ g}$).

Question 5

- **M1** use unit rate: $3/18$ or litres per m^2 and multiply by 25 oe
- **A1** 4.17 litres awrt
- **Answer: 4.17 litres** (litres per $\text{m}^2 = 3 / 18 = 1/6$; litres needed = $25 / 6 = 4.166666... \Rightarrow 4.17$).

Question 6

- **M1** find amount per person: $480/8$ oe
- **A1** 300 g cao
- **Answer: 300 g** ($480 \text{ g} / 8 = 60 \text{ g per person}$; $60 \text{ g} \times 5 = 300 \text{ g}$).

Question 7

- **M1** calculate price per 100 g or per kg for both packs (e.g. $4.50/7.5$ or $3.20/5$)
- **A1** Pack A is better value: £0.60 per 100 g vs £0.64 per 100 g cao
- **Answer: Pack A is better value. Pack A: £4.50/750 g = £0.60 per 100 g. Pack B: £3.20/500 g = £0.64 per 100 g.**

Question 8

- **M1** find speed $210/3 = 70$ mph oe
- **A1** 490 miles cao
- **Answer: 490 miles** (speed = $210/3 = 70$ mph; distance = $70 \times 7 = 490$).

Question 9

- **M1** find butter per person: $125/6$ oe
- **M1** multiply per person amount by 9 oe
- **A1** 187.5 g cao
- **Answer: 187.5 g** ($125/6 = 20.833... \text{ g per person}$; $\times 9 = 187.5 \text{ g}$).

Question 10

- **M1** find grams per £1: $250/2.50 = 100$ g per £1 oe
- **M1** multiply by 45 to get grams: 100×45 oe
- **A1** 4500 g = 4.5 kg cao
- **Answer: 4500 g = 4.5 kg** (250 g for £2.50 gives 100 g per £1; $100 \times 45 = 4500 \text{ g}$).

Question 11

- **M1** find constant of proportionality $k = y/x = 15/3 = 5$
- **A1** 35 cao
- **Answer: 35** ($k = 15/3 = 5$, so $y = 5 \times 7 = 35$).

Question 12

- **M1** find fraction for blue $= 3/(3+5) = 3/8$ oe
- **A1** 15 litres cao
- **Answer: 15 litres** (blue $= 3/8$ of 40 $= 15$ L).

Question 13

- (a) **M1** calculate price per kg for both: $1.80/0.75$ and $2.92/1.2$ oe
- (a) **A1** 2.40 and 2.433... per kg cao
- **(a) Answer: 750 g tub: £1.80/0.75 = £2.40 per kg; 1.2 kg bag: £2.92/1.2 = £2.433... per kg.**
- (b) **A1** 750 g tub is best value because £2.40 per kg $<$ £2.433... per kg cao
- **(b) Answer: 750 g tub is best value because it costs £2.40 per kg compared with £2.433... per kg for the 1.2 kg bag.**
- (c) **M1** consider combinations and compute cost, e.g. $2 \times 1.2 \text{ kg} + 1 \times 100 \text{ g}$ gives 2.5 kg and cost $2 \times 2.92 + 0.25$
- (c) **A1** £6.09 cao
- **(c) Answer: Buy 2 x 1.2 kg bags and 1 x 100 g pack: weight $= 2.4 + 0.1 = 2.5$ kg. Cost $= 2 \times 2.92 + 0.25 = £6.09$.**

Question 14

- **M1** divide milk by 4 to get 90 ml per person cso
- **M1** divide banana by 4 to get 30 g per person cso
- **M1** multiply 90 ml and 30 g by 11 to show the amounts cso
- **A1** 990 ml and 330 g cao cso
- **Answer: 990 ml milk and 330 g banana** ($360/4 = 90 \text{ ml}$; $120/4 = 30 \text{ g}$; $90 \times 11 = 990 \text{ ml}$; $30 \times 11 = 330 \text{ g}$).

Question 15

- **M1** find milk per slice: $250/5 = 50 \text{ ml}$ oe
- **M1** find total milk for 14 slices: $50 \times 14 = 700 \text{ ml} = 0.7 \text{ L}$ oe
- **M1** multiply litres by price: 0.7×0.84 oe
- **A1** £0.59 cao (nearest penny) awrt
- **Answer: £0.59** (50 ml per slice, 14 slices require 700 ml $= 0.7 \text{ L}$; cost $= 0.7 \times 0.84 = £0.588 \rightarrow £0.59$).

Question 16

- (a) **M1** convert milk to litres and find cost: $0.2 \text{ L} \times 0.65$ oe
- (a) **M1** convert sugar and fruit to kg and find individual costs: $0.05 \text{ kg} \times 0.80$ and $0.1 \text{ kg} \times 2.40$ oe
- (a) **A1** £0.41 cao
- **(a) Answer: £0.41** (milk: $0.2 \times 0.65 = 0.13$; sugar: $0.05 \times 0.80 = 0.04$; fruit: $0.1 \times 2.40 = 0.24$; total $= 0.41$).
- (b) **M1** find profit per shake: $2.20 - 0.41$ oe
- (b) **M1** multiply profit per shake by 5 oe
- (b) **A1** £8.95 cao
- **(b) Answer: £8.95** (profit per shake $= 2.20 - 0.41 = 1.79$; profit for 5 shakes $= 1.79 \times 5 = £8.95$).