



5.2F Direct and Inverse Proportion: Foundation Tier Practice

EDEXCEL 1MA1 · Calculator allowed · about 55 minutes

Total Marks

Name: _____ Date: ____ / ____ / ____

Answer ALL questions. Show all your working.

- 1** A recipe uses 3 cups of flour to make 12 biscuits. Work out how many cups of flour are needed to make 4 biscuits.

(Total for Question 1 is 1 mark)

- 2** Sam can type 90 words in 3 minutes. At the same rate, how many words can Sam type in 1 minute?

(Total for Question 2 is 1 mark)

- 3** Direct proportion. If 5 pens cost 15 pounds, work out the cost of 8 pens.

(Total for Question 3 is 2 marks)

- 4** A car uses 6 litres of petrol to travel 30 miles. Work out how many litres the car will use to travel 50 miles at the same rate.

(Total for Question 4 is 2 marks)

- 5** Inverse proportion. 8 identical machines take 15 hours to complete a job. How many hours would 12 identical machines take to complete the same job, assuming they work at the same rate?

(Total for Question 5 is 3 marks)

- 6** A map scale says 1 cm represents 5 km. On the map, two towns are 7.2 cm apart. Work out the actual distance in kilometres.

(a) Find the actual distance in kilometres. (2)

(b) If a car travels at 60 km/h, how many minutes will it take to travel between the towns? Give your answer to the nearest minute. (2)

(Total for Question 6 is 4 marks)

- 7** Direct proportion with context. A small plant needs 150 ml of water every 5 days. How much water does it need in 14 days?

(a) Find the water needed in 14 days. (3)

(b) If the gardener has a 2 litre bottle, how many full bottles are needed for 14 days? (1)
Give your answer as a whole number of full bottles required.

(Total for Question 7 is 4 marks)

8 Inverse proportion in a simple setting. 5 painters can paint a fence in 9 hours. How long would 3 painters take to paint the same fence, working at the same rate?

(a) Find the time in hours for 3 painters.

(3)

(b) If each painter works 8 hours per day, how many whole days are needed to finish the job with 3 painters? Give your answer as a whole number of days. (2)

(Total for Question 8 is 5 marks)

Mark scheme · 5.2F Direct and Inverse Proportion: Foundation Tier Practice

Question 1

- **B1** 1 cup cao
- **Answer: 1 cup of flour (cao).** (3 cups for 12 biscuits means 0.25 cups per biscuit; for 4 biscuits $0.25 \times 4 = 1$.)

Question 2

- **B1** 30 words cao
- **Answer: 30 words.** ($90 / 3 = 30$.)

Question 3

- **M1** find unit cost $15/5 = 3$ or scale $15 \times 8/5$
- **A1** 24 pounds cao
- **Answer: 24 pounds.** (Unit cost $15/5 = 3$. $3 \times 8 = 24$.)

Question 4

- **M1** find litres per mile: $6/30 = 0.2$ or scale $6 \times 50/30$
- **A1** 10 litres cao
- **Answer: 10 litres.** ($6/30 = 0.2$ litres per mile. $0.2 \times 50 = 10$.)

Question 5

- **M1** use inverse proportion: time proportional to $1/\text{machines}$, or compute total machine-hours $8 \times 15 = 120$
- **M1** divide total machine-hours by 12 to find time for 12 machines
- **A1** 10 hours cao
- **Answer: 10 hours.** (Total work = $8 \times 15 = 120$ machine-hours. $120/12 = 10$.)

Question 6

- (a) **M1** calculate 7.2×5 or equivalent scaling
- (a) **A1** 36 km cao
- (a) **Answer: 36 km**
- (b) **M1** time in hours = $36/60 = 0.6$ hours or equivalent conversion to minutes
- (b) **A1** 36 minutes awrt
- (b) **Answer: 36 minutes (awrt).**

Question 7

- (a) **M1** find daily water or scale: $150/5 = 30$ ml per day
- (a) **M1** 30×14 or equivalent
- (a) **A1** 420 ml cao
- (a) **Answer: 420 ml**
- (b) **B1** 1 bottle cao (2 litres = 2000 ml and $420 \text{ ml} < 2000 \text{ ml}$, so 1 full 2 litre bottle is enough)
- (b) **Answer: 1 full bottle**

Question 8

- (a) **M1** calculate total painter-hours: $5 \times 9 = 45$
- (a) **M1** divide total painter-hours by 3 to find time: $45/3$
- (a) **A1** 15 hours cao
- (a) **Answer: 15 hours**
- (b) **M1** convert hours to days: $15/8 = 1.875$
- (b) **A1** 2 days cao
- (b) **Answer: 2 days**