



EP.M126 Line Graphs and Conversion Graphs

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

Total Marks

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Name: _____ Date: ____ / ____ / ____

Answer ALL questions. Show all your working.

- 1** The conversion graph shows a straight line through (0, 0) and (3, 540). The horizontal axis is cups and the vertical axis is millilitres. How many millilitres are in 2 cups?

- ☐ A) 320 ml
- ☐ B) 360 ml
- ☐ C) 540 ml
- ☐ D) 200 ml
- ☐ E) 400 ml

(Total for Question 1 is 1 mark)

- 2** Using the same cups-to-millilitres graph (3 cups = 540 ml), how many cups are needed for 450 ml?

- ☐ A) 2 cups
- ☐ B) 2.25 cups
- ☐ C) 2.5 cups
- ☐ D) 3 cups
- ☐ E) 2 $\frac{2}{3}$ cups

(Total for Question 2 is 1 mark)

- 3** From the cups-to-millilitres graph, what is the millilitre reading for 7 $\frac{1}{2}$ cups?

(Total for Question 3 is 2 marks)

- 4 The miles-to-kilometres conversion graph is a straight line through (0, 0) and (5, 8). How many kilometres are there in 3 miles according to the graph?

- ☐ A) 3.6 km
- ☐ B) 4.8 km
- ☐ C) 5 km
- ☐ D) 6.4 km
- ☐ E) 2.5 km

(Total for Question 4 is 1 mark)

- 5 From the miles-to-kilometres graph (5 miles = 8 km), which of these points lies on the line?

- ☐ A) (2, 3)
- ☐ B) (2, 3.2)
- ☐ C) (4, 7)
- ☐ D) (3, 5)
- ☐ E) (1, 1.8)

(Total for Question 5 is 1 mark)

- 6 Using the miles-to-kilometres graph, how many miles are there in 12.8 km?

- ☐ A) 6 miles
- ☐ B) 7.5 miles
- ☐ C) 8 miles
- ☐ D) 8.5 miles
- ☐ E) 9 miles

(Total for Question 6 is 1 mark)

- 7 The cups graph has the point (4, 720) on it. Which sentence describes that point?

- ☐ A) 4 ml equals 720 cups
- ☐ B) 4 cups equals 720 ml
- ☐ C) 720 cups equals 4 ml
- ☐ D) 4 cups equals 720 litres
- ☐ E) 4 cups equals 72 ml

(Total for Question 7 is 1 mark)

8 From the cups-to-millilitres conversion, how many millilitres are in half a cup?

- ☐ A) 90 ml
- ☐ B) 100 ml
- ☐ C) 120 ml
- ☐ D) 180 ml
- ☐ E) 45 ml

(Total for Question 8 is 1 mark)

9 A recipe needs 900 ml. Using the cups graph, how many cups should be used?

- ☐ A) 4 cups
- ☐ B) 4.5 cups
- ☐ C) 5 cups
- ☐ D) 6 cups
- ☐ E) 3 cups

(Total for Question 9 is 1 mark)

10 A visitor line graph shows the number of visitors to a park on the first day of each month from January to June: Jan 120, Feb 150, Mar 180, Apr 170, May 210, Jun 240. (a) Describe the overall trend from January to June. (b) Between which two consecutive months did the number of visitors decrease?

(a) Describe the overall trend from January to June. (1)

(b) Between which two consecutive months did the number of visitors decrease? (1)

(Total for Question 10 is 2 marks)

11 Using the visitor numbers Jan to Jun (Jan 120, Feb 150, Mar 180, Apr 170, May 210, Jun 240), calculate the total number of visitors over these six months.

(Total for Question 11 is 2 marks)

- 12** From the cups-to-millilitres graph ($1 \text{ cup} = 180 \text{ ml}$), how many cups are needed for 225 ml?
Give your answer as a fraction or decimal.

(Total for Question 12 is 2 marks)

- 13** A conversion graph shows a straight line through $(0, 0)$ and $(8, 600)$. The horizontal axis is loaves and the vertical axis is grams. Work out the mass, in grams, of 3 loaves.

(Total for Question 13 is 3 marks)

- 14** Using the miles-to-kilometres graph (through $(0,0)$ and $(5,8)$), find the gradient of the line and explain what this gradient represents in context.

(Total for Question 14 is 3 marks)

15 A runner plans a route of 10 miles. Use the miles-to-kilometres conversion graph (5 miles = 8 km) to answer the questions. (a) How many kilometres is the 10-mile route? (b) How long will it take the runner to complete the route if they run at 8 km/h? (c) If the runner instead runs at 5 miles per hour, what is that speed in km/h? (d) The runner wants to finish in 1 hour 40 minutes. What average speed in km/h is required?

(a) How many kilometres is the 10-mile route? (1)

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(b) How long will it take the runner to complete the route if they run at 8 km/h? (2)

.....
(c) If the runner instead runs at 5 miles per hour, what is that speed in km/h? (2)

.....
(d) The runner wants to finish in 1 hour 40 minutes. What average speed in km/h is required? (3)

.....
(Total for Question 15 is 8 marks)

Mark scheme · EP.M126 Line Graphs and Conversion Graphs

Question 1

- **B1** correct option B (360 ml) cao
- **Answer: B) 360 ml** (since 3 cups = 540 ml so 1 cup = 180 ml; $2 \times 180 = 360$ ml.)

Question 2

- **B1** correct option C (2.5 cups) cao
- **Answer: C) 2.5 cups** ($450 \div 180 = 2.5$)

Question 3

- **M1** 7.5×180 or equivalent method seen (1 cup = 180 ml)
- **A1** 1,350 ml cao
- **Answer: 1,350 ml** ($7.5 \times 180 = 1,350$)

Question 4

- **B1** correct option B (4.8 km) cao
- **Answer: B) 4.8 km** (1 mile = 1.6 km so $3 \times 1.6 = 4.8$ km)

Question 5

- **B1** correct option B ((2, 3.2)) cao
- **Answer: B) (2, 3.2)** ($2 \times 1.6 = 3.2$)

Question 6

- **B1** correct option C (8 miles) cao
- **Answer: C) 8 miles** ($12.8 \div 1.6 = 8$)

Question 7

- **B1** correct option B (4 cups = 720 ml) cao
- **Answer: B) 4 cups equals 720 ml**

Question 8

- **B1** correct option A (90 ml) cao
- **Answer: A) 90 ml** (1 cup = 180 ml so $0.5 \times 180 = 90$ ml)

Question 9

- **B1** correct option C (5 cups) cao
- **Answer: C) 5 cups** ($900 \div 180 = 5$)

Question 10

- (a) **B1** overall increase from 120 to 240; visitors generally rise oe
- (a) **Answer: Overall the number of visitors increases from January to June (rising from 120 to 240).**
- (b) **B1** correctly identifies March to April (180 to 170) cao
- (b) **Answer: Between March and April (180 down to 170).**

Question 11

- **M1** sum of monthly values seen (or equivalent method)
- **A1** 1,070 cao
- **Answer: 1,070 visitors** ($120 + 150 + 180 + 170 + 210 + 240 = 1,070$).

Question 12

- **M1** method to divide 225 by 180 or equivalent (eg $225/180$ seen)
- **A1** 1.25 or $1 \frac{1}{4}$ cao
- **Answer: 1.25 cups** ($225 \div 180 = 1.25$), which is $1 \frac{1}{4}$ cups.

Question 13

- **M1** find mass per loaf: $600 \div 8 (= 75)$ or equivalent
- **M1** multiply by 3 seen (3×75)
- **A1** 225 g cao
- **Answer: 225 g** ($600 \div 8 = 75$ g per loaf; $3 \times 75 = 225$)

Question 14

- **M1** correct method for gradient: rise/run = $8/5$ seen
- **M1** numeric gradient 1.6 seen
- **A1** context: 1 mile corresponds to 1.6 km or gradient is 1.6 km per mile cao
- **Answer: Gradient = $8/5 = 1.6$. This means 1 mile = 1.6 kilometres (the line rises 1.6 km for each mile).**

Question 15

- (a) **B1** 16 km cao
- (a) **Answer: 16 km** ($10 \times 1.6 = 16$).
- (b) **M1** method: time = distance/speed ($16 \div 8$) seen
- (b) **A1** 2 hours cao
- (b) **Answer: 2 hours** ($16 \div 8 = 2$).
- (c) **M1** method: convert miles to km using 1 mile = 1.6 km (5×1.6) seen
- (c) **A1** 8 km/h cao
- (c) **Answer: 8 km/h** ($5 \times 1.6 = 8$).
- (d) **M1** convert 1 h 40 min to hours ($1 + 40/60 = 5/3$) seen
- (d) **M1** use speed = distance/time with 16 km and time $5/3$ h ($16 \div 5/3$) or equivalent
- (d) **A1** 9.6 km/h cao
- (d) **Answer: 9.6 km/h** ($1 \text{ h } 40 \text{ min} = 5/3 \text{ h}$; speed = $16 \div (5/3) = 16 \times 3/5 = 48/5 = 9.6$).