



EP.M121 Reading Scales and Measuring Instruments

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** A short ruler shows a mark labelled 0 cm at one end and a mark labelled 4 cm further along. There are 8 equal small divisions between the 0 cm and 4 cm marks. What length does one small division represent?

- ☐ A) 0.25 cm
- ☐ B) 0.5 cm
- ☐ C) 0.4 cm
- ☐ D) 2 mm
- ☐ E) 1 cm

(Total for Question 1 is 1 mark)

- 2** A measuring jug has marks labelled 1.0 L and 2.0 L. There are 5 equal divisions between these two marks. A meniscus sits at the third division above the 1.0 L mark. What is the volume shown?

- ☐ A) 1.4 L
- ☐ B) 1.6 L
- ☐ C) 1.5 L
- ☐ D) 1.2 L
- ☐ E) 1.8 L

(Total for Question 2 is 1 mark)

- 3** A thermometer has marks labelled 10 degrees and 20 degrees. There are 4 equal divisions between these two marks. A pointer is at the second division above 10 degrees. What is the temperature reading?

- ☐ A) 12.5 degrees
- ☐ B) 15 degrees
- ☐ C) 17.5 degrees
- ☐ D) 14 degrees
- ☐ E) 20 degrees

(Total for Question 3 is 1 mark)

4 A bathroom scale uses a dial where the 0 kg and 6 kg marks are connected by 8 equal divisions.

(a) Calculate the value of one small division in kilograms. (1)

.....

(b) If the pointer is at the 5th small division above 0, what mass is shown? (2)

.....

(Total for Question 4 is 3 marks)

5 A ruler is marked 0 cm and 5 cm, with 20 equal divisions between them. A point is at the 7th small division from 0. What is the measurement shown?

☐ A) 1.7 cm

☐ B) 1.75 cm

☐ C) 1.25 cm

☐ D) 1.9 cm

☐ E) 1.8 cm

(Total for Question 5 is 1 mark)

6 A small measuring cylinder is labelled 0 mL and 25 mL. There are 4 equal divisions between those marks.

(a) Calculate the volume represented by one small division. (1)

.....

(b) If the liquid level is at the 3rd division, what volume is that? (1)

.....

(Total for Question 6 is 2 marks)

7 A water tank gauge shows marks labelled 40 L and 60 L. There are 8 equal divisions between these marks. A pointer is on the 3rd division above 40 L. What reading does the gauge show?

☐ A) 45.0 L

☐ B) 47.5 L

☐ C) 46.0 L

☐ D) 48.0 L

☐ E) 50.0 L

(Total for Question 7 is 1 mark)

- 8** A petrol pump display shows 0 L and 30 L with 5 equal divisions between the marks. a) Calculate the value of one small division. b) If the needle points at the second division above 0, what volume is shown?

(a) Calculate the value of one small division. (1)

(b) If the needle points at the second division above 0, what volume is shown? (1)

(Total for Question 8 is 2 marks)

- 9** A laboratory thermometer is labelled -5 degrees and 25 degrees with 6 equal divisions between these marks. a) What is the value of one small division? b) What is the temperature at the 3rd division above -5 degrees? c) If the pointer is halfway between the 3rd and 4th division, what temperature is shown?

(a) Value of one small division. (1)

(b) Temperature at the 3rd division above -5 degrees. (1)

(c) Temperature halfway between the 3rd and 4th division. (1)

(Total for Question 9 is 3 marks)

- 10** A measuring cylinder is labelled 0 mL and 150 mL with 5 equal divisions between. Sam fills to the 2nd division, then adds one third of the cylinder's full capacity, and finally pours out 20 mL. Work out the final volume remaining in the cylinder.

(Total for Question 10 is 6 marks)

- 11** A weighbridge gauge shows marks labelled 2.0 tonnes and 5.0 tonnes with 6 equal divisions between. a) Calculate the value of one small division. b) A truck registers at the 4th division above 2.0 tonnes. What is that reading? c) Another vehicle's reading is twice the first truck's reading minus 0.5 tonnes. What is the second vehicle's reading?

(a) Value of one small division. (2)

(b) Reading at the 4th division above 2.0 tonnes. (2)

(c) Second vehicle reading = twice first truck's reading minus 0.5 tonnes. (2)

(Total for Question 11 is 6 marks)

- 12** A carpenter uses two rulers. Ruler A shows 0 cm and 50 cm with 10 equal divisions between. Ruler B shows 0 cm and 1 m with 8 equal divisions between. He measures a board as the 6th division on Ruler A and the 4th division on Ruler B. Work out the total length of the board in centimetres.

(Total for Question 12 is 5 marks)

Mark scheme · EP.M121 Reading Scales and Measuring Instruments

Question 1

- **B1** correct option B (0.5 cm) cao
- **Answer: B) 0.5 cm** (each division = $4 / 8 = 0.5 \text{ cm} = 5 \text{ mm}$).

Question 2

- **B1** correct option B (1.6 L) cao
- **Answer: B) 1.6 L** (each division = $1.0 \text{ L} / 5 = 0.2 \text{ L}$, 3 divisions gives $1.0 + 0.6 = 1.6 \text{ L}$).

Question 3

- **B1** correct option B (15 degrees) cao
- **Answer: B) 15 degrees** (each division = $10 / 4 = 2.5 \text{ degrees}$; $10 + 2 \times 2.5 = 15$).

Question 4

- (a) **B1** 0.75 kg cao
- (a) **Answer: 0.75 kg**
- (b) **M1** $5 \times 0.75 (= 3.75)$ seen or equivalent method
- (b) **A1** 3.75 kg cao
- (b) **Answer: 3.75 kg**

Question 5

- **B1** correct option B (1.75 cm) cao
- **Answer: B) 1.75 cm** (each division = $5 / 20 = 0.25 \text{ cm}$; $7 \times 0.25 = 1.75 \text{ cm}$).

Question 6

- (a) **B1** 6.25 mL cao
- (a) **Answer: 6.25 mL**
- (b) **B1** 18.75 mL cao
- (b) **Answer: 18.75 mL**

Question 7

- **B1** correct option B (47.5 L) cao
- **Answer: B) 47.5 L** (each division = $20 / 8 = 2.5 \text{ L}$; $40 + 3 \times 2.5 = 47.5 \text{ L}$).

Question 8

- (a) **B1** 6 L cao
- (a) **Answer: 6 L**
- (b) **B1** 12 L cao
- (b) **Answer: 12 L**

Question 9

- (a) **B1** 5 degrees cao
- (a) **Answer: 5 degrees**
- (b) **B1** 10 degrees cao
- (b) **Answer: 10 degrees**
- (c) **B1** 12.5 degrees cao
- (c) **Answer: 12.5 degrees**

Question 10

- **M1** $150 / 5 (= 30)$ seen for one division
- **M1** 2nd division identified as $2 \times 30 = 60$ mL
- **M1** one third of full capacity = $150 / 3 = 50$ mL seen
- **dM1** addition $60 + 50 = 110$ mL seen ft
- **M1** 20 mL subtraction from 110 seen
- **A1** final answer 90 mL cao
- **Answer: 90 mL**

Question 11

- (a) **M1** $(5.0 - 2.0) / 6 (= 0.5)$ seen
- (a) **A1** 0.5 tonnes cao
- **(a) Answer: 0.5 tonnes**
- (b) **M1** $4 \times 0.5 (= 2.0)$ seen
- (b) **A1** 4.0 tonnes cao
- **(b) Answer: 4.0 tonnes**
- (c) **M1** $2 \times 4.0 (= 8.0)$ and subtraction of 0.5 seen
- (c) **A1** 7.5 tonnes cao
- **(c) Answer: 7.5 tonnes**

Question 12

- **M1** Ruler A division $50 / 10 = 5$ cm seen
- **M1** Ruler A measurement $6 \times 5 = 30$ cm seen
- **M1** Ruler B division $100 / 8 = 12.5$ cm seen
- **M1** Ruler B measurement $4 \times 12.5 = 50$ cm seen
- **A1** Total 80 cm cao
- **Answer: 80 cm**