



KS2.M-Y6M1 Measurement: Units, Perimeter, Area and Volume

Calculators not allowed · about 60 minutes

Total Marks

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Name: _____ Date: ____ / ____ / ____

Answer ALL questions. Show all your working.

1 Convert the measurements.

(a) Write 4.2 kilometres in metres.

(1)

(b) Write 3,450 millimetres in metres.

(1)

2 A garden path is 7.5 m long and 80 cm wide. Work out its area in square metres.

(2)

3 A school field is a rectangle 120 m by 85 m. A path 2 m wide goes all around the edge inside the field. What is the area of the path in square metres?

(2)

4 Find the perimeter of an L-shaped garden made from two rectangles. The larger rectangle is 8 m by 5 m. A smaller rectangle (cut from one corner) is 3 m by 2 m as shown: what is the perimeter of the L-shape in metres?

Figure (to be drawn): Imagine a rectangle 8 by 5 with a 3 by 2 rectangle removed from one corner; pupils should work from dimensions.

(2)

- 5** The area of a triangle is 48 cm^2 . The base is 12 cm . Work out the height of the triangle.

(3)

- 6** A parallelogram has base 14 cm and height 6 cm . Calculate its area in square centimetres.

(2)

- 7** A cuboid has length 8 cm , width 5 cm and height 3 cm . Calculate its volume in cubic centimetres.

(2)

- 8** A fish tank is a cuboid with internal dimensions 90 cm by 40 cm by 50 cm . A gardener fills the tank to a depth of 30 cm with water. What volume of water is in the tank in litres? ($1 \text{ litre} = 1000 \text{ cm}^3$)

(3)

- 9** A rectangular carpet is 3.2 m long and 2.5 m wide. Work out its area in square metres, giving your answer to one decimal place.

(2)

- 10** A rectangular plot measures 1500 cm by 90 m. Convert the shorter side to metres then find the perimeter of the plot in metres.

(2)

- 11** Explain whether this statement is always, sometimes or never true. "If two triangles have the same base and the same area, then they must have the same height." Explain your answer.

(2)

- 12** A triangular flower bed has base 6 m and height 2.4 m. It is surrounded by a 0.6 m wide border. What is the area of the border to one decimal place in square metres? (Assume the border follows similar triangular shape.)

(3)

- 13** A metal sheet is a parallelogram with side lengths 12 cm and 7 cm. The perpendicular distance (height) between the 12 cm sides is 5 cm. Calculate the area of the sheet in square centimetres.

(2)

- 14** A box's external dimensions are 32 cm by 20 cm by 15 cm. The box wall is uniform and 1 cm thick. Estimate the internal volume of the box in cubic centimetres.

(2)

15 A rectangle has area 54 cm^2 . One side measures 6 cm . Find the length of the other side.

(2)

16 A water tank is a cuboid with length 2.4 m , width 1.5 m and height 1.2 m . A pump removes 540 litres. How much water remains in the tank in litres? ($1 \text{ m}^3 = 1000$ litres)

(3)

17 A playground has a triangular sand area with vertices A, B and C. $BC = 12 \text{ m}$ is the base of the triangle and the perpendicular height from BC to vertex A is 6 m . $AB = 9 \text{ m}$. Work out the area of the sand in square metres.

(2)

18 A rectangle and a parallelogram have the same base 10 cm and the same area 80 cm^2 . Explain how you could find the height of the parallelogram and give the height.

(3)

Mark scheme · KS2.M-Y6M1 Measurement: Units, Perimeter, Area and Volume

Question 1

- (a) **B1** 4,200 cao
- (a) Answer: **4,200**
- (b) **B1** 3.45 cao
- (b) Answer: **3.45**

Question 2

- **M1** convert 80 cm to 0.8 m or equivalent and set up 7.5×0.8
- **B1** 6.0 cao
- Answer: **6.0**

Question 3

- **M1** subtract inner rectangle area from outer: $(120 \times 85) - (116 \times 81)$ or equivalent
- **B1** 804 cao
- Answer: **804**

Question 4

- **M1** identify the outer outline sides: lengths 8, 5, $(8-3)=5$, $(5-2)=3$, 3, 2 or equivalent
- **B1** 26 cao
- Answer: **26**

Question 5

- **M1** use area = $\frac{1}{2} \times \text{base} \times \text{height}$ or rearrange to height = $(2 \times \text{area}) / \text{base}$
- **M1** substitute values: height = $(2 \times 48) / 12$
- **B1** 8 cm cao
- Answer: **8 cm**

Question 6

- **M1** use area = base x height
- **B1** 84 cao
- Answer: **84**

Question 7

- **M1** use volume = length x width x height
- **B1** 120 cao
- Answer: **120**

Question 8

- **M1** calculate volume in cm³: $90 \times 40 \times 30$ or equivalent
- **M1** convert cm³ to litres by dividing by 1000
- **B1** 108 litres cao
- Answer: **108**

Question 9

- **M1** calculate 3.2×2.5
- **B1** 8.0 cao
- Answer: **8.0**

Question 10

- **M1** convert 1500 cm to 15 m then set up perimeter $2(15+90)$
- **B1** 210 cao
- **Answer: 210**

Question 11

- **M1** state that area = $\frac{1}{2} \times \text{base} \times \text{height}$ and use reasoning
- **B1** conclude statement is sometimes true with explanation that different heights could be compensated by different bases (or vice versa) or show counterexample reasoning
- **Answer: sometimes**

Question 12

- **M1** find outer similar triangle dimensions: base $6+2 \times 0.6 = 7.2$ and height $2.4+2 \times 0.6 = 3.6$
- **M1** calculate outer area $\frac{1}{2} \times 7.2 \times 3.6$ and inner area $\frac{1}{2} \times 6 \times 2.4$ and subtract
- **B1** 5.8 cao
- **Answer: 5.8**

Question 13

- **M1** use area = base x height with base 12 and height 5
- **B1** 60 cao
- **Answer: 60**

Question 14

- **M1** subtract twice the thickness from each external dimension: internal dims $30 \times 18 \times 13$
- **B1** 7020 cao
- **Answer: 7020**

Question 15

- **M1** divide area by one side: $54 / 6$
- **B1** 9 cm cao
- **Answer: 9 cm**

Question 16

- **M1** calculate volume in m³: $2.4 \times 1.5 \times 1.2$
- **M1** convert to litres by $\times 1000$ then subtract 540
- **B1** 3,780 cao
- **Answer: 3780**

Question 17

- **M1** use area = $\frac{1}{2} \times \text{base} \times \text{height}$ with base 12 and height 6
- **B1** 36 cao
- **Answer: 36**

Question 18

- **M1** state formula area = base x height for parallelogram or area = base x height for rectangle
- **M1** rearrange to height = area / base and substitute values
- **B1** 8 cm cao
- **Answer: 8 cm**