

Y7 Maths

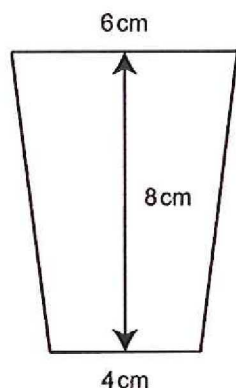
Unit 9 Test

Perimeter, Area and Volume

Non-Calculator paper

Name: MARKSHEME

- 1 Find the area of this trapezium.



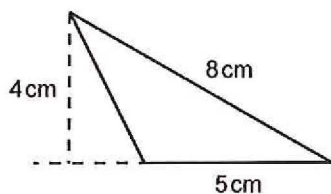
$$A = \frac{(a+b)h}{2}$$

$$= \frac{(6+4) \times 8}{2} \text{ (m1)}$$

$$= 40$$

40 (A1) cm²
(2 marks)

- 2 Find the area of this triangle.



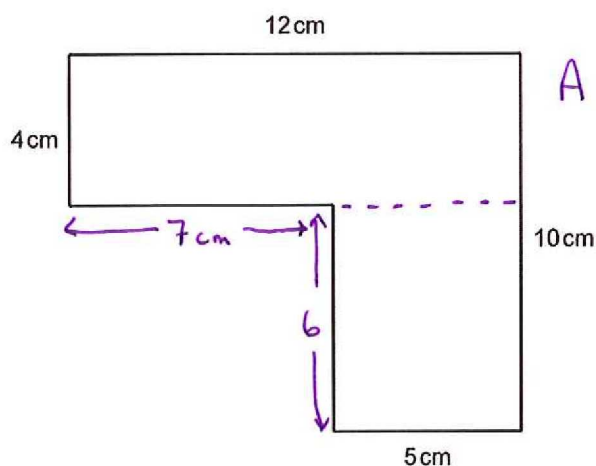
$$A = \frac{1}{2}bh$$

$$= \frac{1}{2} \times 5 \times 4 \text{ (m1)}$$

$$= 10$$

10 (A1) cm²
(2 marks)

- 3 a Work out the area of this shape made from rectangles.



Either

$$A = (4 \times 12) + (5 \times 6) \text{ (m1)}$$

$$= 48 + 30$$

$$= 78$$

OR

$$A = (5 \times 10) + (7 \times 4)$$

$$= 50 + 28$$

$$= 78$$

78 (A1) cm²

- b Work out its perimeter.

44 (A1) cm
(3 marks)

- 4 A cuboid has edges of length 5 cm, 6 cm, 4 cm.

Work out the total surface area of the cuboid.

$$\begin{aligned} S.A &= 2(5 \times 6 + 5 \times 4 + 6 \times 4) \quad (m1) \\ &= 2(74) \\ &= 148 \end{aligned}$$

Attempting to find the area of 6 faces, with at least 4 correct.

148 ^(A1) cm²
(2 marks)

- 5 A fish tank is in the shape of a cuboid.

The base of the tank is 45 cm by 20 cm.

Sam pours in water to a depth of 15 cm.

Work out the amount of water that he poured in.

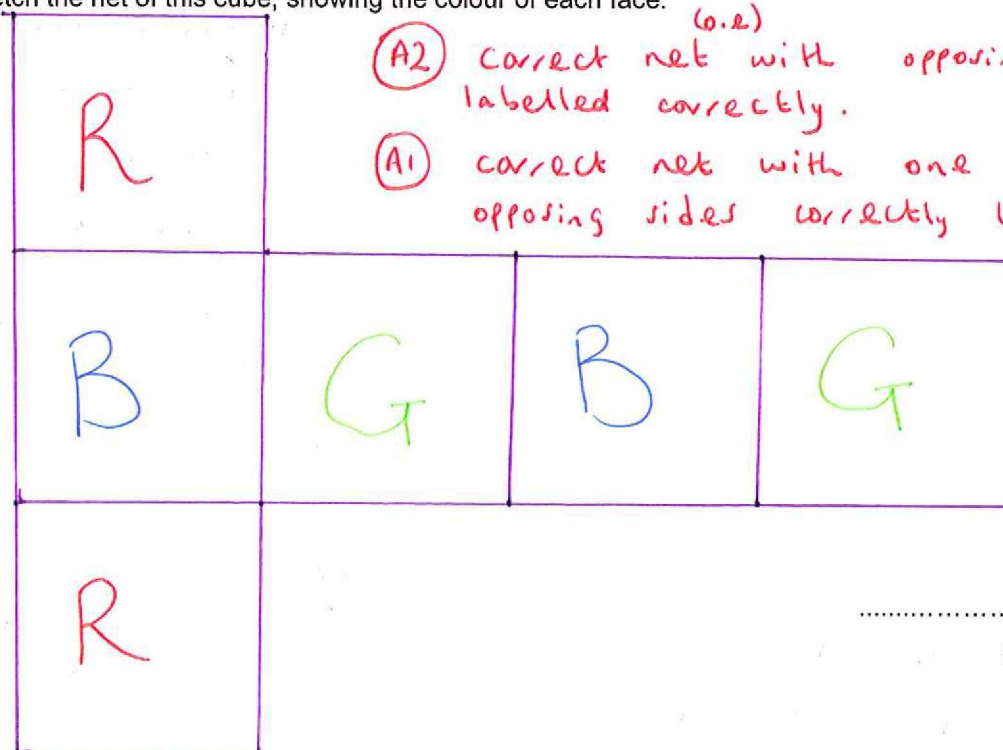
Give your answer in litres.

$$\begin{aligned} V &= 45 \times 20 \times 15 \quad (m1) \\ &= 13,500 \text{ cm}^3 \\ &= 13,500 \text{ mL} \quad (m1) \text{ conversion} \\ &= 13.5 \text{ L} \end{aligned}$$

13.5 ^(A1) /
(3 marks)

- 6 A cube has 2 opposite faces coloured red, 2 opposite faces coloured blue and the other faces coloured green.

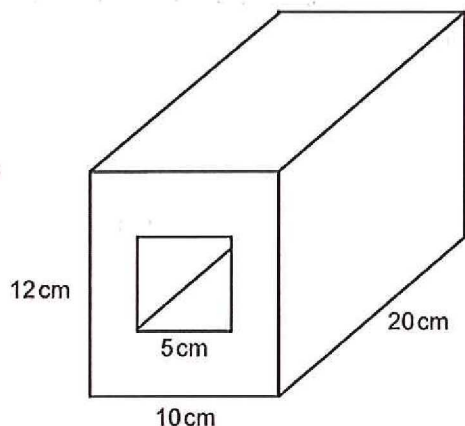
Sketch the net of this cube, showing the colour of each face.



(A2) correct net with opposing sides labelled correctly. (6.2)
(A1) correct net with one pair of opposing sides correctly labelled.

.....
(2 marks)

- 7 Here is a block of wood with a hole drilled all the way through it.
The cross section of the hole is square with side 5 cm.



$$\begin{aligned}
 V_w &= V_b - V_h \\
 &= 12 \times 10 \times 20 - 5 \times 5 \times 20 \\
 &= 2400 - 500 \\
 &= 1900
 \end{aligned}$$

both calculations seen (M1) subtracting 'their' values. (M1)

Work out the volume of the wood.

$$\begin{aligned}
 &1900 \text{ cm}^3 \\
 &\text{(3 marks)}
 \end{aligned}$$

(A1)

- 8 Change a volume of 50 cm^3 to mm^3 .

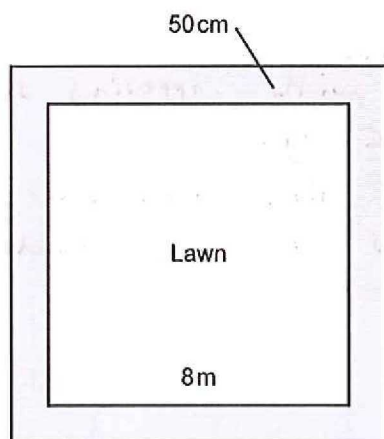
$$\begin{aligned}
 &50 \times 1000 \\
 &50 \times 10 \times 10 \times 10 \\
 &= 50,000
 \end{aligned}$$

(M1)

$$\begin{aligned}
 &50,000 \text{ mm}^3 \\
 &\text{(2 mark)}
 \end{aligned}$$

(A1)

- 9 The diagram shows a lawn and a path.



Alternate soln:

$$\begin{aligned}
 &4(8 \times 0.5) + 4(0.5)^2 \\
 &= 16 + 1 \\
 &= 17
 \end{aligned}$$

(M1) (A1)

The lawn is square with sides of length 8 m.

The path is 50 cm wide and goes all round the lawn.

Work out the area of the path. Give your answer in m^2 .

$$\begin{aligned}
 A_p &= A_b - A_L \\
 &= 9^2 - 8^2 \\
 &= 81 - 64 \\
 &= 17
 \end{aligned}$$

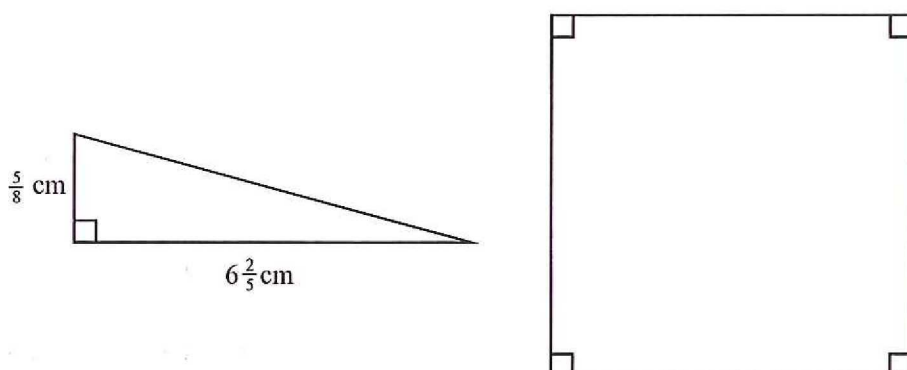
(M1)

$$\begin{aligned}
 &17 \text{ m}^2 \\
 &\text{(2 marks)}
 \end{aligned}$$

(A1)

10.

Diagrams **NOT**
accurately drawn



The area of the square is 18 times the area of the triangle.

Work out the **perimeter** of the square.

$$\begin{aligned}
 A_T &= \frac{1}{2} \times 6\frac{2}{5} \times \frac{5}{8} \quad (\text{M1}) \\
 &= \frac{1}{2} \times \frac{32}{5} \times \frac{5}{8} \quad (\text{B1}) \\
 &= \frac{1}{2} \times 4 \\
 &= 2 \text{ cm}^2
 \end{aligned}$$

$$\begin{aligned}
 A_S &= 18 \times 2 \quad (\text{M1}) \\
 &= 36 \text{ cm}^2
 \end{aligned}$$

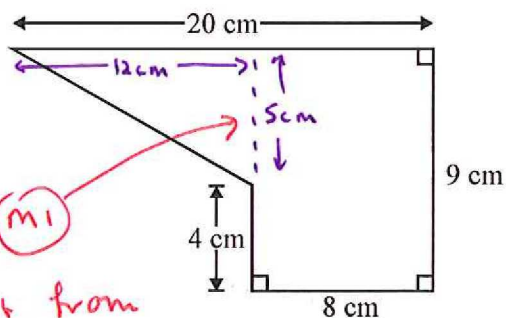
$$\text{length of square} = \sqrt{36} \quad (\text{A1}) = 6 \text{ cm}$$

$$\text{Perimeter} = 6 \times 4$$

$$= 24 \quad (\text{A1})$$

cm
(Total 5 marks)

11.



SPLITTING
UP SHAPE

(Can be evident from
working)

The diagram shows a shape.
Work out the area of the shape.

$$A = (9 \times 8) + \frac{1}{2} (12 \times 5) \quad (\text{M1}) (\text{M1}) \text{ one for each part}$$

$$= 72 + 30$$

$$= 102 \text{ cm}^2$$

Diagram **NOT**
accurately drawn

Alternate soln:

$$\begin{aligned}
 A &= (4 \times 8) + \frac{(8+20) \times 5}{2} \\
 &= 32 + 70 \\
 &= 102 \text{ cm}^2
 \end{aligned}$$

$$102 \quad (\text{A1})$$

cm²
(Total 4 marks)

12. Here is a net of a cube.

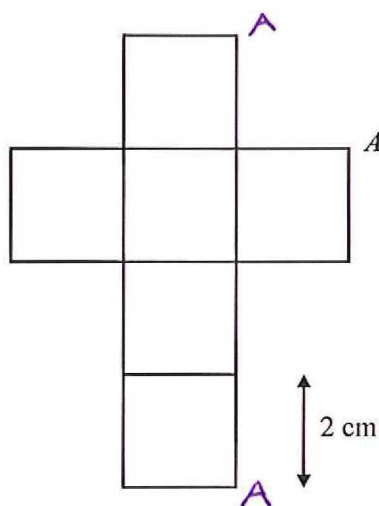


Diagram **NOT**
accurately drawn

(B2) Both correct

(B1) One correct

or (B1) 3 answers, 2 correct

The net is folded to make the cube.
Two other vertices meet at A.

- (a) Mark each of them with the letter A.

(2)

The length of each edge of the cube is 2 cm.

- (b) Work out the volume of the cube.

(M1) $2 \times 2 \times 2 = 8 \text{ cm}^3$

.....8..... cm^3

(2)

(Total 4 marks)

13. Change 1.2 cubic metres to cubic centimetres.

(M1) 1.2×1000000
or $1.2 \times 100 \times 100 \times 100$

=1,200,000.....(A1) cubic centimetres

(Total 2 marks)

14.

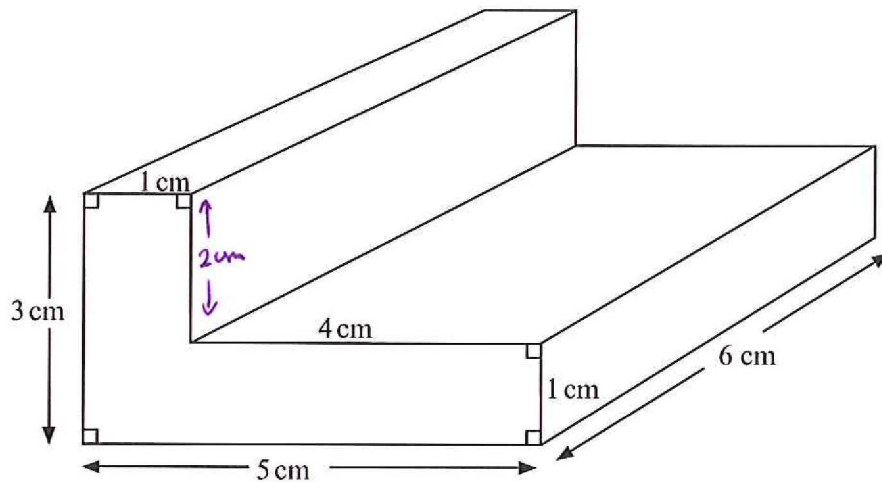


Diagram NOT
accurately drawn

Work out the total surface area of the L-shaped prism.
State the units with your answer.

$$\begin{aligned}
 \text{S.A.} &= 2(3 \times 1 + 4 \times 1) + (3 \times 6) + (1 \times 6) + (2 \times 6) + (4 \times 6) + (1 \times 6) + (5 \times 6) \quad \text{(m1) add.} \\
 &= 2(7) + 16(6) \\
 &= 14 + 96 \\
 &= 110 \text{ cm}^2
 \end{aligned}$$

At least 6 faces with intention to add.

(m1) for an attempt to find the area of one face.

(A1)
110 cm²

(B1) with or without numerical answer.

(Total 4 marks)

END OF TEST

Overall mark: /40

Challenge

Please note that this section will **not be marked** and that this should only be completed if you have finished the test in full and checked over your answers!

$$11. \frac{1}{2} \times \frac{1}{3} = \frac{1}{6}$$

$$12. \frac{1}{4} \times \frac{1}{5} = \frac{1}{20}$$

$$13. \frac{1}{6} \times \frac{1}{7} = \frac{1}{42}$$

$$14. \frac{1}{8} \times \frac{1}{9} = \frac{1}{72}$$

$$15. \frac{1}{10} \times \frac{1}{11} = \frac{1}{110}$$

$$16. \frac{1}{12} \times \frac{1}{13} = \frac{1}{156}$$

$$17. \frac{1}{14} \times \frac{1}{15} = \frac{1}{210}$$

$$18. \frac{1}{16} \times \frac{1}{17} = \frac{1}{272}$$

$$19. \frac{1}{18} \times \frac{1}{19} = \frac{1}{342}$$

$$20. \frac{1}{20} \times \frac{1}{21} = \frac{1}{420}$$

$$21. \frac{1}{22} \times \frac{1}{23} = \frac{1}{506}$$

$$22. \frac{1}{24} \times \frac{1}{25} = \frac{1}{600}$$

$$23. \frac{1}{26} \times \frac{1}{27} = \frac{1}{702}$$