Mathletics Instant Workbooks

Measurement, Area, Surface Area and Volume

Student Book - Series J-2

Mathletics Instant Workbooks
# Measurement, area, surface area and volume

## Student Book - Series J 2

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### Practice Tests

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Author of The Topics and Topic Tests: AS Kalra
Measurement, area, surface area and volume

Topic 1 - Plane shapes

**QUESTION 1** Name the following triangles.

a

b

c

d

e

f

**QUESTION 2** Name the following quadrilaterals.

a

b

c

d

e

f

**QUESTION 3** Name the following polygons.

a

b

c

d

e

f

**QUESTION 4** Name the following shapes.

a

b

c
QUESTION 1  Complete the following table.

<table>
<thead>
<tr>
<th>Name of the shape</th>
<th>Number of sides ( (n) )</th>
<th>Number of triangles formed from one vertex ( (n - 2) )</th>
<th>Angle sum of the shape ( (n - 2)180^\circ )</th>
</tr>
</thead>
<tbody>
<tr>
<td>a Triangle</td>
<td>3</td>
<td>1</td>
<td>((3 - 2)180^\circ = 180^\circ)</td>
</tr>
<tr>
<td>b Quadrilateral</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>c Pentagon</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>d Hexagon</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>e Heptagon</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>f Octagon</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>g Nonagon</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>h Decagon</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>i Undecagon</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>j Dodecagon</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

QUESTION 2  Complete the following sentences.

a  The angle sum of a triangle is equal to _______________________

b  The angle sum of a quadrilateral is equal to ____________________

c  The angle sum of a pentagon is equal to _______________________

d  The angle sum of a hexagon is equal to _______________________

e  The angle sum of a heptagon is equal to _______________________

f  The angle sum of an octagon is equal to _______________________

g  The angle sum of a nonagon is equal to _______________________

h  The angle sum of a decagon is equal to _______________________

i  The angle sum of an undecagon is equal to _______________________

j  The angle sum of a dodecagon is equal to _______________________

k  The angle sum of a polygon with \( n \) sides is equal to _______________________

l  The angle sum of the exterior angles of a polygon is always equal to _______________________

**Measurement, area, surface area and volume**

**Topic 3 - Areas of plane shapes**

**QUESTION 1** Write the area formula next to the shapes given below.

a) 

b) 

c) 

d) 

e) 

f) 

g) 

h) 

i) 

**QUESTION 2** Find the area of the following shapes. All measurements are in centimetres.

a) 

b) 

c) 

d) 

e) 

f) 

g) 

h) 

i) 

j) 

k) 

l) 

\[ \pi = \frac{22}{7} \]
**Measurement, area, surface area and volume**

**Topic 4 - Surface area of a solid**

**QUESTION 1**  Find the surface area of the following rectangular prisms.

- **a**
  - Dimensions: 9 cm x 6 cm x 7 cm

- **b**
  - Dimensions: 4.5 cm x 4.5 cm x 4.5 cm

- **c**
  - Dimensions: 16.3 cm x 4.9 cm x 5.2 cm

**QUESTION 2**  Find the surface area of the following triangular prisms.

- **a**
  - Base: 8 cm, Height: 10 cm, Rectangular side: 12 cm, Triangular side: 20 cm

- **b**
  - Base: 12 cm, Height: 10.8 cm, Rectangular side: 18 cm, Triangular side: 12 cm

- **c**
  - Base: 4 cm, Height: 5 cm, Rectangular side: 14.6 cm, Triangular side: 3 cm

**QUESTION 3**  Find the surface area of the following trapezoidal prisms.

- **a**
  - Upper base: 10 cm, Lower base: 3.6 m, Height: 8.5 m, Rectangular side: 14 m

- **b**
  - Upper base: 8 m, Lower base: 12 m, Height: 1.75 m, Rectangular side: 2.5 m

- **c**
  - Upper base: 15 m, Lower base: 6.5 m, Height: 8.7 m, Rectangular side: 6 m

**QUESTION 4**  Find the surface area of the following solid cylinders.

- **a**
  - Radius: 5 cm, Height: 11 cm

- **b**
  - Radius: 6 cm, Height: 12 cm

- **c**
  - Radius: 14 cm, Height: 20.7 cm
Measurement, area, surface area and volume

Topic 5 - Volume of a prism

**QUESTION 1** Find the volume of the following rectangular prisms (give answers correct to one decimal place).

<table>
<thead>
<tr>
<th>a</th>
<th>b</th>
<th>c</th>
</tr>
</thead>
<tbody>
<tr>
<td>![Rectangular Prism A](5.8 cm 5.8 cm 5.8 cm)</td>
<td>![Rectangular Prism B](9.6 cm 5.6 cm 3.5 cm)</td>
<td>![Rectangular Prism C](15.6 cm 3.7 cm 3.7 cm)</td>
</tr>
</tbody>
</table>

**QUESTION 2** Find the volume of the following triangular prisms (give answers correct to four significant figures).

<table>
<thead>
<tr>
<th>a</th>
<th>b</th>
<th>c</th>
</tr>
</thead>
<tbody>
<tr>
<td>![Triangular Prism A](10 cm 30.5 cm 7.8 cm)</td>
<td>![Triangular Prism B](5.4 cm 10.6 cm 7.8 cm)</td>
<td>![Triangular Prism C](12.6 cm 28 cm 10.6 cm)</td>
</tr>
</tbody>
</table>

**QUESTION 3** Find the volume of the following trapezoidal prisms (give answers correct to two decimal places).

<table>
<thead>
<tr>
<th>a</th>
<th>b</th>
<th>c</th>
</tr>
</thead>
<tbody>
<tr>
<td>![Trapezoidal Prism A](20.7 cm 46.8 cm 15.9 cm 11.7 cm)</td>
<td>![Trapezoidal Prism B](9 m 3.6 m 15 m 1.6 m 17.8 m)</td>
<td>![Trapezoidal Prism C](6.2 cm 25.7 cm 12.5 cm 18.6 cm 20.7 cm)</td>
</tr>
</tbody>
</table>

**QUESTION 4** Find the volume of the following solids.

<table>
<thead>
<tr>
<th>a</th>
<th>b</th>
<th>c</th>
</tr>
</thead>
<tbody>
<tr>
<td>![Solid A](5 m 10 m 16.5 m)</td>
<td>![Solid B](14 m 10 m 16 m 12 m)</td>
<td>![Solid C](3 m 12 m 10 m 4 m 4 m)</td>
</tr>
</tbody>
</table>
Measurement, area, surface area and volume

Topic 6 - Volume of a cylinder

**QUESTION 1** Find the volume of the following cylinders (correct to one decimal place).

- a [Diagram of cylinder with dimensions 6 cm x 10 cm]
- b [Diagram of cylinder with dimensions 8 cm x 15 cm]
- c [Diagram of cylinder with dimensions 7 cm x 12.5 cm]

**QUESTION 2** Find the volume of the following cylinders (correct to three significant figures).

- a [Diagram of cylinder with dimensions 8 cm x 12 cm]
- b [Diagram of cylinder with dimensions 28 cm x 10 cm]
- c [Diagram of cylinder with dimensions 6 cm x 15.4 cm]

**QUESTION 3** Find the volume of the following (correct to two decimal places).

- a [Diagram of cylinder with dimensions 5.6 cm x 3 cm]
- b [Diagram of cylinder with dimensions 14 cm x 25 cm]
- c [Diagram of irregular shape with dimensions 14.5 cm x 10.8 cm]

**QUESTION 4** Find the volume of the following solids (correct to one decimal place).

- a [Diagram of cylinder with dimensions 25 cm x 17.6 cm (diameter of hole = 8 cm)]
- b [Diagram of cylinder with dimensions 21 cm x 2 cm (diameter of hole = 8.3 cm)]
- c [Diagram of cuboid with dimensions 12 cm x 10 cm (diameter of hole = 7 cm)]
1. Find the area of a square with side length 12 cm.
   - A) 48 cm²
   - B) 288 cm²
   - C) 144 cm²
   - D) None of these

2. Calculate the volume of a cube with side length 5 cm.
   - A) 30 cm³
   - B) 125 cm³
   - C) 150 cm³
   - D) None of these

3. A rectangular prism has sides of length 9 cm, 11 cm and 12 cm. Find its volume.
   - A) 32 cm³
   - B) 339 cm³
   - C) 594 cm³
   - D) 1188 cm³

4. A cube has a volume of 4913 cm³. Find the length of each side of the cube.
   - A) 70 cm
   - B) 8.4 cm
   - C) 181 cm
   - D) 17 cm

5. Find the perimeter of a square of side 4.2 cm.
   - A) 17.64 cm
   - B) 74.1 cm
   - C) 16.8 cm
   - D) None of these

6. If the perimeter of a square is 36 cm, then the area of the square is
   - A) 6 cm²
   - B) 9 cm²
   - C) 36 cm²
   - D) 81 cm²

7. How many square centimetres are there in a square metre?
   - A) 100
   - B) 1000
   - C) 10 000
   - D) 100 000

8. The radius of the Earth is approximately 6400 km. What is the circumference of the Earth at the equator?
   - A) 40 212 km
   - B) 1.29 \times 10^8 km
   - C) 20 106 km
   - D) 38 340 km

9. What is the area of a circle of radius 3.2 m? Answer to the nearest square metre.
   - A) 101 m²
   - B) 32 m²
   - C) 129 m²
   - D) 8 m²

10. The volume of a rectangular prism is 216 cm³. Find the total surface area of a cube having the same volume.
    - A) 64 cm²
    - B) 216 cm²
    - C) 144 cm²
    - D) 196 cm²
### Topic Test

#### Instructions
- This part consists of 15 questions
- Each question is worth 1 mark
- Attempt ALL questions
- Calculators may be used

#### Time allowed: 20 minutes

<table>
<thead>
<tr>
<th>Questions</th>
<th>Answers only</th>
<th>Marks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 State the formula for the area of a circle.</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>2 Convert 1.68 m² to cm².</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>3 What is the side length of a square that has an area of 160 000 m²?</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>4 How many square metres in 2 hectares?</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>5 Calculate the surface area of a cube of side 2.5 m.</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>6 Calculate the volume of a rectangular prism 3.5 m long, 3.4 m wide and 2.8 m high.</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>7 Calculate the circumference of a circle with radius equal to 5 cm.</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>8 For the solid given, calculate: the area of rectangle BCDH.</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>9 the area of triangle ABH.</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>10 the area of AHFG.</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>11 the total surface area.</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>12 the volume.</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>13 A cube has a volume of 3375 cm³. Find the length of each side of the cube.</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>14 Find the perimeter of a square of side 5.6 cm.</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>15 The volume of a cube is 512 cm³. Find its surface area.</td>
<td></td>
<td>1</td>
</tr>
</tbody>
</table>

Total marks achieved for PART B 15