Area Volume – Question Set

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1. Plane-Figure Areas

Q1 Rectangle 13 cm × 9 cm – find its area.

Q2 Triangle base 11 m, height 7 m.

Q3 Parallelogram: base 12 cm, perpendicular height 5 cm.

Q4 Trapezium with parallel sides 6 m and 10 m, height 4 m.

Q5 Circle diameter 18 cm. (a) Find the area. (b) Find the circumference.

Q6 A semicircle radius 5 cm – find its area.

Q7 Find the shaded L-shape area (two rectangles 8×3 m and 5×2 m joined).

2. Surface Area

Q8 Closed cylinder $r = 6$ cm, $h = 12$ cm.

Q9 Rectangular prism 14 cm × 9 cm × 5 cm.

Q10 A right prism has triangular base area 18 cm^2 and perimeter 18 cm; height 10 cm. Find its total surface area.

Q11 A can (open top) has radius 4 cm and height 9 cm. Find its exterior surface area.

3. Volumes

Q12 Cuboid 4 m × 3.5 m × 2.1 m.

Q13 Cylinder $r = 2.5$ m, $h = 7$ m.

Q14 A triangular prism: base triangle $b = 6$ cm, $h = 4$ cm; prism length 15 cm.

Q15 Water tank holds 12,000 L. If cylindrical, height 3 m. Find tank radius (nearest cm).

Q16 A cone is cut from a cylinder of same base ($r = 4$ cm, $h = 9$ cm). What fraction of the cylinder's volume is the cone?

4. Composite 2-D & 3-D Problems

Q17 Floor plan: rectangle 6 m $\times$ 5 m attached to semicircle (diameter 6 m). Find floor area.

Q18 A garden bed is a trapezium joined to a half-circle (parallel side 2 m). Base = 4 m, other parallel side = 2 m, height = 1.8 m. Find total area (nearest 0.1 m^2).

Q19 A solid combines a cube 3 cm each edge with a square-based pyramid (same base, height 4 cm). Find total volume.

Q20 A cylindrical column $r = 0.6$ m, $h = 3$ m is to be painted (excluding bases). How many square metres of paint are required?

5. Scale Drawings & Conversions

Q21 On a 1:250 map a playground measures 5.6 cm $\times$ 4.2 cm. Find its actual area (m^2).

Q22 Convert 0.015 m^3 to (a) cm^3, (b) litres.

Q23 A pool is 9 m $\times$ 4 m $\times$ 1.5 m. How many kilolitres of water does it hold?

Q24 A block of concrete is 1.2 m^3. Density = 2.4 t/m^3. Find its mass.

Challenge Question

Q1 A cylindrical water tower (closed top and bottom) of radius 3.5 m is topped with a hemispherical dome of the same radius. The cylindrical wall is 18 m tall.

a) Calculate the external surface area to be painted (nearest m^2).

b) Calculate the total internal volume of water the tower can hold, in kilolitres (nearest kL).

c) If paint costs \$42 per 10 m^2, estimate the total paint cost (no wastage).