# Year 9 Circles, Area and Volume – Developing

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Answers and worked solutions · 10 questions

## A. Use area and volume

**1.** **d = 10 cm**

$\pi r^2 = 25\pi$, so $r^2 = 25$

r = 5 cm

d = 2r = 10 cm

**2.** **area 25.12 $cm^2$; perimeter 20.56 cm**

r = 4 cm; area = ½ × 3.14 × $4^2$ = 25.12 $cm^2$

Curved edge = ½ × 3.14 × 8 = 12.56 cm

Perimeter = 12.56 + 8 (the diameter) = 20.56 cm

**3.** **126.5 $m^2$**

Rectangle 11 × 9 = 99 $m^2$; triangle ½ × 11 × 5 = 27.5 $m^2$

Total: 126.5 $m^2$

**4.** **81.12 $cm^2$**

Rectangle 8 × 7 = 56 $cm^2$; semicircle ½ × 3.14 × $4^2$ = 25.12 $cm^2$

Total: 56 + 25.12 = 81.12 $cm^2$

**5.** **5966 $cm^3$**

$V = \pi r^2 h$; cross-section 3.14 × $10^2$ = 314 $cm^2$

Volume: 314 × 19 = 5966 $cm^3$

**6.** **112 $cm^2$**

Base: 4 × 4 = 16 $cm^2$

Four triangles: 4 × ½ × 4 × 12 = 96 $cm^2$

Total: 112 $cm^2$

**7.** **0.53 micrometres**

1 micrometre = 1000 nanometres

530 ÷ 1000 = 0.53 micrometres

**8.** **area 78.8 $m^2$ (estimate 73 $m^2$)**

Estimate: $10^2 - 3 \times 3^2 = 100 - 27 = 73$ $m^2$

$100 - 3.14 \times 2.6^2 = 100 - 21.2264 = 78.8$ $m^2$ (1 d.p.)

**9.** **452.16 $m^2$**

r = 24 ÷ 2 = 12 m

$A = \pi r^2 = 3.14 \times 144 = 452.16$ $m^2$

**10.** **Only the radius is squared: $A = 3.14 \times 6^2 = 113.04$ $m^2$.**

Error: π was squared as well

$r^2 = 36$

A = 3.14 × 36 = 113.04 $m^2$