

10 $3x$

11 a 19.9 b 24.8625 c 389.098125 d 3.7710...

12 a 528.75 b 265 225 c 37.184...

13 $3.85 \times 10^{13} \text{ m}^2$

7 Unit test

1 $140 \times \pi = 440 \text{ cm}$ (3 s.f.) [2] [1 mark for 439 or 439.8]

2 a $\frac{1}{2}(10 + 18) \times 15 = 210 \text{ cm}^2$ [1]

b $18 - 10 = 8$ [1]

$15^2 + 8^2 = x^2$, $x = 17$ [1]

Perimeter = $10 + 15 + 18 + 17 = 60 \text{ cm}$ [1]

3 $60 = \frac{1}{2}(12 + 8) \times h$ [1]

$60 = 10h$ [1]

$h = 6 \text{ cm}$ [1]

4 26 litres = $26\,000 \text{ cm}^3$ [1]

$\pi r^2 \times 36 = 26\,000$ [1]

$r = \sqrt{\frac{26000}{36\pi}} = 15.1612$ [1] = 15.16 cm (2 d.p.) [1]

5 a area of triangular face = $\frac{1}{2} \times 20 \times 21 = 210 \text{ cm}^2$ [1]

length = $6720 \div 210 = 32 \text{ cm}$ [1]

b $2 \times \text{triangular faces} = 420 \text{ cm}^2$ [1]

rectangular faces $29 \times 32 + 21 \times 32 + 20 \times 32 = 2240 \text{ cm}^2$ [1]

Surface area = $420 + 2240 = 2660 \text{ cm}^2$ [1]

6 a 64π [1]

b $128\pi = \pi r^2$ [1]

$r = \sqrt{128} = 11.3 \text{ cm}$ (nearest mm) [1]

7 $\frac{1}{4} \times 2\pi \times 4.5 = 7.068...$ [1]

$7.068... + 4.5 + 4.5 = 16.068...$ = 16.1 (3 s.f.) [1]

8 $4\pi \times 5.6^2$ [1] = 394 cm^2 (3 s.f.) [1]

9 cylinder: $\pi \times 4^2 + 2\pi \times 4 \times 12$ [1] = $112\pi \text{ cm}^2$ [1]

cone: $\pi \times 4 \times 8 = 32\pi \text{ cm}^2$ [1]

Total surface area = $112\pi + 32\pi = 144\pi \text{ cm}^2$ [1]

10 Circumference of whole circle = $10\pi = 31.4159...$ [1]

Fraction of circle = $\frac{6}{31.4169...}$ (= 0.19098...) [1]

$\frac{6}{31.4169...} \times 360 = 68.8^\circ$ (1 d.p.) [1]

11 $\frac{1}{3} \times 8.35^2 \times 6.85 = 159.2$ (1 d.p.) [2] [1 for correct formula, 1 mark for lower bounds used]

$\frac{1}{3} \times 8.452 \times 6.95 = 165.4$ (1 d.p.) [1]

Sample student answer

The question asks for the answer correct to 3 s.f. The student has rounded to 4 s.f. Although all the maths is correct they must make sure they write the answer in the requested way.