Text *C4 Volumes* Answers

C4.1 Volumes of Cubes, Cuboids, Cylinders and Prisms

1. (a) 125 cm^3 (b) 360 cm^3 (c) 8.96 m^3
   (d) 1005 mm^3 (to the nearest mm^3) (e) 2 m^3 (to the nearest m^3)
   (f) 1508 cm^3 (to the nearest cm^3) (g) 504 cm^3 (h) 144 cm^3
   (i) 2.4 m^3
2. (a) 0.25 m^3 (b) 0.20 m^3 (to the nearest m^3)
3. (a) 3.864 m^3 (b) 3.312 m^3
4. (a) 251327 cm^3 (b) 203.6 cm^3, 2036 cm^3
   (c) 249291 cm^3 (to the nearest cm^3)
5. (a) 120 cm^3 (b) 105 cm^3
6. (a) 168 cm^3 (b) 45 cm^3 (c) 176 cm^3 (d) 1600 cm^3
7. (a) 1200 cm^3 (b) 130 cm^3
8. 20 000 cm^3
9. 67.5 m^3
10. 15 m^3
11. 26 m^3 (to the nearest m^3)
12. (ii) 14 litres (13.56 litres)
13. (a) 462 cm^3 (to the nearest cm^3) (b) 3 cm
14. (a) 36 .9 m^2 (b) 295.2 m^3 (c) 0.32 m
15. (a) 500 cm^3 (b) (i) 400 cm^3 (ii) 80%
    (c) (i) 42 cm^2 (ii) 9.5 cm (to the nearest mm)

C4.2 Mass, Volume and Density

1. (a) 96 cm^3 (b) 88 cm^3 (c) 88 g
2. (a) 8000 cm^3 (b) 0.75 g/cm^3
3. 0.794 g/cm^3
4. (a) 402 123.86 cm^3 (b) 402.124 kg

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C4.2

5. (a) 120 cm^3 (b) 2.5 g/cm^3 (c) 375 g (d) 1000 g (1 kg)
6. 80 g
7. (a) 60 m^3 (b) 60 000 kg (c) volume: 52 m^3; mass: 52 000 kg
8. (a) 6.28 cm^2 (to 2 d.p.) (b) 1414 g (c) 40 cm
9. (a) 4188.79 cm^3 (b) 0.048 g/cm^3 (c) 83 g (to the nearest g)
10. (a) 6 g/cm^3 (b) 89 cm

C4.3 Volumes of Pyramids, Cones and Spheres

1. (a) 283 cm^3 (to the nearest cm^3) (b) 314 cm^3 (to the nearest cm^3)
   (c) 257 cm^3 (to the nearest cm^3) (d) 1.6 m^3 (to 1 d.p.)
   (e) 1018 cm^3 (to the nearest cm^3) (f) 2399 cm^3 (to the nearest cm^3)
   (g) 905 cm^3 (h) 262 cm^3 (to the nearest cm^3) (i) 500 cm^3 (j) 144 cm^3
2. r = 6.08 cm (to 2 d.p.)
3. d = 3 cm (to the nearest cm)
4. (a) 1131 cm^3 (to the nearest cm^3) (b) 1283 cm^3 (to the nearest cm^3)
   (c) 115 cm^3 (to the nearest cm^3) (d) 816 cm^3 (to the nearest
5. 0.1 cm (to 1 d.p.)
6. 81.9 cm^3 (to the nearest cm^3)
7. 20.6 cm^3 (to 1 d.p.)
8. V = 634 cm^3

C4.4 Dimensions

1. (a) $L^2 \Rightarrow$ Area (b) None (c) $L^3 \Rightarrow$ Volume
   (d) $L^2 \Rightarrow$ Area (e) $L^2 \Rightarrow$ Area (f) None
   (g) mixed dimensions (h) $L^3 \Rightarrow$ Volume (i) $L^3 \Rightarrow$ Volume
2. (a) Yes (b) No (c) No (d) Yes (e) Yes (f) Yes
3. A = $ab + ac + bc + cd$
4. $\sin\theta$ has dimension zero (it is the quotient of two lengths so it is a number)
5. $V = \frac{13}{17}\pi r^2 d$ (This is the only formula with dimension L^3.)

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6. $V = \pi R^2 h - \pi r^2 h$ (This formula is the only one with dimension L^3.)

7. (a) The formulae that can give a volume are the ones with dimension L^3:

$$\frac{4}{3}\pi r^3 \text{ , } \frac{3}{4}\pi r^3.$$

(b) The only formula that can give an area is the one with dimension L^2:

$$\frac{4}{3}\pi r^2.$$

8. $6x^2 + 4y^2$ has dimension L^2 and hence, can give a surface area.

$x^3 + y^3$ has dimension L^3 and hence, can give a volume.

9. $V = \dfrac{\pi d^2 h}{4} + \dfrac{\pi d^2 a}{12}$, since it is the only formula with dimension L^3.

10. (a) L (b) $L^2 \Rightarrow$ area

11. (a) Dimension $L \Rightarrow$ perimeter (b) Dimension $L^3 \Rightarrow$ volume

12.

$2\pi r$	$4\pi r^2$	$\pi r^2 h$	πr^2	lbh	$\frac{1}{2}bh$
		✓		✓	

13. The formulae which represent areas are the formulae with dimension L^2.

These are: πab, $\pi(a + b)l$.

14. (iii) $\pi h(a + b)$. It is the only formula with dimension L^2, the dimension of an area.

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