

2. (i) (a) 754 cm^3 (b) $1\,232 \text{ cm}^3$
 (c) $4\,714 \text{ cm}^3$ (d) $1\,018 \text{ cm}^3$
 (e) $1\,006 \text{ cm}^3$ (f) 302 cm^3
 (ii) (a) 943 cm^2 (b) 704 cm^2
 (c) $1\,886 \text{ cm}^2$ (d) 679 cm^2
 (e) 629 cm^2 (f) 302 cm^2
3. $96 \text{ cm}^2, 48 \text{ cm}^3$ 4. $72 \text{ cm}^2, 8.5 \text{ cm}$
5. 36 cm^3 6. $188 \frac{4}{7} \text{ cm}^3$
7. $34\pi \text{ cm}^2, 40\pi \text{ cm}^3$ 8. 15 cm
9. $867 \text{ cm}^3, 490 \text{ cm}^2$ 10. $1\,760 \text{ cm}^3$
11. 288 cm^3 12. $19 \frac{1}{11} \text{ cm}$
13. (a) $8x \text{ cm}^3$ (b) 500 cm^3

Exercise 9.3 (p. 227)

1. (a) $408 \text{ cm}^3, 266 \text{ cm}^2$ (b) $2\,757 \text{ cm}^3, 951 \text{ cm}^2$
 (c) $19\,852 \text{ cm}^3, 3\,545 \text{ cm}^2$
 (d) $3\,590 \text{ cm}^3, 1\,134 \text{ cm}^2$
 (e) $6\,879 \text{ cm}^3, 1\,749 \text{ cm}^2$ (f) $14\,703 \text{ cm}^3, 2\,902 \text{ cm}^2$
2. (a) $7 \text{ cm}, 1\,437 \frac{1}{3} \text{ cm}^3$ (b) $2 \text{ cm}, 33 \frac{11}{21} \text{ cm}^3$
 (c) $3 \text{ cm}, 113 \frac{1}{7} \text{ cm}^3$ (d) $21 \text{ cm}, 38\,808 \text{ cm}^3$
 (e) $14 \text{ cm}, 11\,498 \frac{2}{3} \text{ cm}^3$ (f) $4 \text{ cm}, 268 \frac{4}{21} \text{ cm}^3$
3. $113\,143 \text{ litres}$ 4. 12.2 cm
5. (a) $8 : 1$ (b) $4 : 1$
6. (a) $64 : 1$ (b) $16 : 1$
7. 374 million km^2 8. $1\,047 \text{ cm}^3$
9. Volume increases to 8 times its original volume.
 Surface area increases to 4 times its original surface area.
10. Volume decreases to $\frac{1}{8}$ of the original volume.
 Surface area decreases to $\frac{1}{4}$ of the original surface area.
11. $\$200$ 12. $3\,486 \text{ cm}^3, 1\,408 \text{ cm}^2$
13. $415 \text{ cm}^2, 754 \text{ cm}^3$
14. (a) 452 cm^3 (b) 10.8 cm
 (c) 824 g (d) 10

Exercise 9.4 (p. 232)

1. (a) $\frac{9}{25}$ (b) $\frac{9}{16}$ (c) $\frac{49}{81}$ (d) $\frac{25}{64}$
2. $4 : 25$ 3. $9 : 1$ 4. $5 : 1$
5. 136.11 cm^2 6. 5.56 cm^2 7. 33.75 cm^2
8. $5 \frac{1}{2} \text{ cm}^2$ 9. $33\,750 \text{ m}^2$
10. 4 cm^2 11. $2 \frac{2}{3} \text{ cm}^2$ 12. 12 cm^2

13. $2 \frac{2}{3}, 6$

14. (a) $\widehat{CAB} = \widehat{ABD}$ (b) (i) $\frac{AB}{AD}$ (ii) $\frac{AB^2}{AC^2}$

15. (a) $\frac{2}{1}, \frac{2}{3}$ (b) $\frac{4}{5}$

16. (a) 16 cm^2 (b) 18 cm^2

17. 7.5 km^2 18. $\$36.45$

19. (a) 37 km (b) 80 cm^2

20. (a) 4.6 cm (b) 5.6 m^2

21. (a) 93 cm (b) 14.5 m^2

22. (a) 8 cm (b) 18 cm^2

Exercise 9.5 (p. 238)

1. (a) $8 : 27$ (b) $27 : 125$
 (c) $27 : 64$ (d) $27 : 343$
2. (a) 12 cubic units (b) 7 cubic units
 (c) 2.2 cubic units (d) 160 cubic units
3. 101.25 g
4. The orange with diameter 6 cm .
5. (a) $800\pi \text{ m}^3$ (b) $\frac{2\,000\pi}{3} \text{ m}^3$ (c) $\frac{4\,400}{3}\pi \text{ m}^3$
 (d) $3\,200\pi \text{ m}^3$ (e) $\frac{16\,000}{3}\pi \text{ m}^3$ (f) $\frac{25\,600}{3}\pi \text{ m}^3$
6. $9 \times 10^{-4} \text{ m}^3$
7. (a) (i) $\frac{9}{25}$ (ii) $\frac{27}{125}$
 (b) (i) $\frac{9}{16}$ (ii) $\frac{27}{64}$
 (c) (i) $\frac{1}{9}$ (ii) $\frac{1}{27}$
8. (a) $2 : 3$ (b) 675 cm^3
9. (a) $2 : 3$ (b) 81 cm^2
10. $2\,187 \text{ g}$ 11. 200 cm^2 12. $1 : 27\,000$
13. (a) 35 cm (b) $\frac{4}{25}$
14. (a) 7.5 cm^4 (b) $8 : 27$ (c) $\$2.70$

Chapter 10

Exercise 10.1 (p. 253)

1. (a) AC (b) XZ
 2. (a) 10 (b) 12 (c) 24
 3. (a) 24 (b) 17 (c) 63
 4. (a) 12 (b) 9 (c) 13
5. (b) Right-angled triangle; \widehat{P}
 (c) Right-angled triangle; \widehat{X}
 (e) Right-angled triangle; \widehat{D}
 (f) Right-angled triangle; \widehat{M}

6. (a) (i) 8.16 (ii) 25.7 (iii) 10.7 (iv) 263
 (b) (i) 32.4 (ii) 43.3 (iii) 8.36 (iv) 15.7
 (c) (i) 26.0 (ii) 67.9 (iii) 108 (iv) 4.02
 7. 3 m 8. 3.1 m 9. 10 m
 10. $h = 12, a = 20$ 11. $x = 36, a = 25$
 12. $QR = 28$ 13. 8.5 m
 14. $\widehat{BFH} = 90^\circ, BH = 13$ 15. 24 cm
 16. 5 cm 17. 9 cm

Exercise 10.2 (p. 259)

1. 4.7 m, 1.7 m (Scale 2 cm : 1 m)
 2. 355 m, 355 m (Scale 1 cm : 50 m)
 3. 25 m (Scale 1 cm : 5 m)
 4. 42 m (Scale 1 cm : 5 m)

Exercise 10.3 (p. 262)

1. (a) AC, AB, BC (b) PR, PQ, QR
 (c) YZ, XZ, XY (d) RT, ST, RS
 2. (a) $\sin y = \frac{ZX}{YZ}, \cos y = \frac{XY}{YZ}, \tan y = \frac{ZX}{XY}$
 (b) $\sin z = \frac{XY}{YZ}, \cos z = \frac{XZ}{YZ}, \tan z = \frac{XY}{XZ}$
 3. (a) $\sin A = \frac{m}{q}, \cos A = \frac{p}{q}, \tan A = \frac{m}{p}$
 (b) $\sin A = \frac{p}{q}, \cos A = \frac{m}{q}, \tan A = \frac{p}{m}$
 (c) $\sin A = \frac{m}{p}, \cos A = \frac{q}{p}, \tan A = \frac{m}{q}$
 (d) $\sin A = \frac{q}{m}, \cos A = \frac{p}{m}, \tan A = \frac{q}{p}$

Exercise 10.4 (p. 264)

1. (a) 0.342 0 (b) 0.427 4 (c) 0.678 2
 (d) 0.939 7 (e) 0.937 3 (f) 0.879 6
 (g) 1.000 (h) 2.087 (i) 1.213
 (j) 0.719 3 (k) 0.700 2 (l) 0.882 9
 (m) 0.414 7 (n) 0.945 7 (o) 0.576 4
 (p) 0.073 24 (q) 0.054 16 (r) 0.068 02
 (s) 0.285 8 (t) 0.755 1 (u) 0.350 8
 2. (a) 0.6° (b) 14.2° (c) 20.7°
 (d) 5.1° (e) 17.1° (f) 89.2°
 (g) 1.1° (h) 44.9° (i) 50.9°
 3. (a) 71.0° (b) 45.2° (c) 19.5°
 (d) 73.5°
 4. (a) 0.396 0 (b) 0.490 9 (c) 0.165 0
 (d) 0.513 1 (e) 0.663 1

Exercise 10.5 (p. 266)

1. (a) 25 (b) 43 (c) 190 (d) 15
 2. (a) 13.81 (b) 12.78 (c) 27.23 (d) 10.39
 3. (a) 64° (b) 42° (c) 58° (d) 70°
 4. (a) 29.1° (b) 36.9° (c) 44.4° (d) 34.1°
 5. 9 cm, 5 cm 6. 40 cm 7. 13 cm
 8. $XY = 16$ cm, $XN = 12$ cm 9. $48^\circ, 48^\circ, 84^\circ$
 10. (a) $p = 10, x^\circ = 56^\circ$ (b) $q = 23, t = 22$
 (c) $m^\circ = 38^\circ, p = 11$ (d) $p = 35, m = 24$
 (e) $r = 14, u^\circ = 50^\circ$ (f) $x = 32, y^\circ = 71^\circ$
 11. 10 units, 162 sq units
 12. (a) By Pythagoras' Theorem, $AB = 9$ cm
 (b) (i) $\frac{9}{40}$ (ii) 102.7° (iii) 167.3°
 13. $x = 43.2, 0.729$ m
 14. (a) 4.24 cm (b) 21.2 cm² (c) 15.9 cm²
 15. (a) $9x^2 = 5^2 + 10^2 - 2 \times 5 \times 10 \cos 27^\circ$ (b) 2.0

Exercise 10.6 (p. 272)

1. 5.20 m, 3 m 2. 212 m, 212 m 3. 11.5 m
 4. 7 m 5. 34 m 6. 63°
 7. 53.1° 8. 24 m 9. 35°
 10. (a) 4.58 m (b) 66.4°
 11. (a) 3 m (b) 3.56 m²
 12. (a) 4.2 m
 (b) (i) 3.25 m \leq distance < 3.75 m
 (ii) $45^\circ \leq$ angle $< 55^\circ$
 13. 109.8°
 14. (a) 36 cm, 48 cm (b) 228 cm
 15. 283 m 16. 49° 17. 502 m
 18. (a) 36.0 m (b) 14.6 m
 (c) 15.1° (d) 55.8 m
 19. (a) 51.2 m (b) (i) 38.7° (ii) 50.2°
 20. (a) $b = \frac{c \sin B}{\sin ECA}$ (b) 17.1 cm

Chapter 11

Exercise 11.1 (p. 285)

4. (a) (4, 2), (-1, 3), (-3, 4), (5, -2), (3, 0), (-4, 0)
 (b) (-4, -2), (1, -3), (3, -4), (-5, 2), (-3, 0), (4, 0)

Exercise 11.2 (p. 290)

3. (a) $A'(-1, 1), B'(-3, 3)$
 (b) $C'(2, 1), D'(3, 2), E'(1, 3)$
 (c) $F'(-1, 1), G'(-1, 2), H'(-3, 2), I'(-3, 1)$
 (d) $J'(2, 0), K'(0, 2), L'(-2, 0), M'(0, -2)$
 4. (a) $A'(1, -2), B'(1, -3), C'(2, -1)$
 (b) (-1, -4), (-2, -4), (-3, -4), (-2, -2)