Chapter 2 Answers

Exercise 2A

1 **a** 15.2 cm **b** 9.57 cm **c** 8.97 cm **d** 4.61 cm
2 **a** $x = 84$, $y = 6.32$
b $x = 13.5$, $y = 16.6$
c $x = 85$, $y = 13.9$
d $x = 80$, $y = 6.22$ (Isosceles Δ)
e $x = 6.27$, $y = 7.16$
f $x = 4.49$, $y = 7.49$ (right-angled)
3 **a** 1.41 cm ($\sqrt{2}$ cm) **b** 1.93 cm
4 **a** 6.52 km **b** 3.80 km
5 **a** 7.31 cm **b** 1.97 cm

Exercise 2B

1 **a** 36.4 **b** 35.8 **c** 40.5 **d** 130
2 **a** 48.1 **b** 45.6 **c** 14.8
d 48.7 **e** 86.5 **f** 77.4
3 $\angle QPR = 50.6°$, $\angle PQR = 54.4°$
4 **a** $x = 43.2$, $y = 5.02$ **b** $x = 101$, $y = 15.0$
c $x = 6.58$, $y = 32.1$ **d** $x = 54.6$, $y = 10.3$
e $x = 21.8$, $y = 3.01$ **f** $x = 45.9$, $y = 3.87$
5 Using the sine rule, $x = \dfrac{4\sqrt{2}}{2+\sqrt{2}}$; rationalising

$$x = \frac{4\sqrt{2}(2-\sqrt{2})}{2} = 4\sqrt{2} - 4 = 4(\sqrt{2}-1).$$

Exercise 2C

1 **a** 70.5°, 109° (109.5°)
2 **a** $x = 74.6, y = 65.4$
$x = 105, y = 34.6$
b $x = 59.8, y = 48.4$
$x = 120, y = 27.3$
c $x = 56.8, y = 4.37$
$x = 23.2, y = 2.06$
3 **a** 5 cm ($\angle ACB = 90°$) **b** 24.6°
c 45.6°, 134(.4)°
4 2.96 cm
5 In one triangle $\angle ABC = 101°$ (100.9°); in the other $\angle BAC = 131°$ (130.9°).

Exercise 2D

1 **a** 3.19 cm **b** 1.73 cm ($\sqrt{3}$ cm)
c 9.85 cm **d** 4.31 cm
e 6.84 cm (isosceles) **f** 9.80 cm
2 11.2 km
3 302 yards (301.5…)
4 4.4
5 42
6 **b** Minimum $AC^2 = 60.75$; it occurs for $x = \frac{1}{2}$.

Exercise 2E

1 **a** 108(.2)° **b** 90° **c** 60°
d 52.6° **e** 137° **f** 72.2°
2 128.5° or 031.5° ($\angle BAC = 48.5°$)
3 $\angle ACB = 22.3°$
4 $\angle ABC = 108(.4)°$
5 104° (104.48°)
6 **b** 3.5

Exercise 2F

1 **a** $x = 37.7$, $y = 86.3$, $z = 6.86$
b $x = 48$, $y = 19.5$, $z = 14.6$
c $x = 30$, $y = 11.5$, $z = 11.5$
d $x = 21.0$, $y = 29.0$, $z = 8.09$
e $x = 93.8$, $y = 56.3$, $z = 29.9$
f $x = 97.2$, $y = 41.4$, $z = 41.4$
g $x = 45.3$, $y = 94.7$, $z = 14.7$
or $x = 134.7$, $y = 5.27$, $z = 1.36$
h $x = 7.07$, $y = 73.7$, $z = 61.2$
or $x = 7.07$, $y = 106$, $z = 28.7$
i $x = 49.8$, $y = 9.39$, $z = 37.0$
2 **a** $\angle ABC = 108°$, $\angle ACB = 32.4°$, $AC = 15.1$ cm
b $\angle BAC = 41.5°$, $\angle ABC = 28.5°$, $AB = 9.65$ cm
3 **a** 8 km **b** 060°
4 107 km
5 12 km
6 **a** 5.44 **b** 7.95 **c** 36.8
7 **a** $AB + BC > AC \Rightarrow x + 6 > 7 \Rightarrow x > 1$;
$AC + AB > BC \Rightarrow 11 > x + 2 \Rightarrow x < 9$
b **i** $x = 6.08$ from $x^2 = 37$,
ii $x = 7.23$ from
$x^2 - 4(\sqrt{2}-1)x - (29 + 8\sqrt{2}) = 0$
8 $x = 4$
9 $AC = 1.93$ cm
10 **b** $\frac{1}{2}$
11 $4\sqrt{10}$
12 $AC = 1\frac{2}{3}$ cm and $BC = 6\frac{1}{3}$ cm

Exercise 2G

1 **a** 23.7 cm^2 **b** 4.31 cm^2 **c** 20.2 cm^2
2 **a** $x = 41.8$ or 138(.2)
b $x = 26.7$ or 153(.3)
c $x = 60$ or 120
3 275(.3) m (third side = 135.3 m)
4 3.58
5 **b** Maximum $A = 3\frac{1}{16}$, when $x = 1\frac{1}{2}$
6 **b** 2.11

Mixed exercise 2H

1 **a** 155°
b 13.7 cm
2 **a** $x = 49.5$, area = 1.37 cm^2
b $x = 55.2$, area = 10.6 cm^2
c $x = 117$, area = 6.66 cm^2
3 6.50 cm^2
4 **a** 36.1 cm^2 **b** 12.0 cm^2
5 **a** 5 **b** $\dfrac{25\sqrt{3}}{2}$ cm^2
7 **b** $1\frac{1}{2}$ cm^2
8 **a** 4 **b** $\dfrac{15\sqrt{3}}{4}$ (6.50) cm^2