Text *H2 Angles, Circles and Tangents* Answers

H2.1 Compass Bearings

1. (a) Krista (b) Joel (c) Shamoy (d) Ricky (e) Tevin
   (f) Ricky (g) NE

2. (a) 100° (b) 155° (c) 177° (d) 355° (e) 207° (f) 180°

3. (a) (i) 150° (ii) 090° (iii) 055° (b) about 200 m

4. (a) 128° (b) 267° (c) 257° (d) 317° (e) 100°

5. (a) 535 m, 450 m (b) 38 m (c) 348°, 67 km (d) 293°
   (e) 073°, 465 m

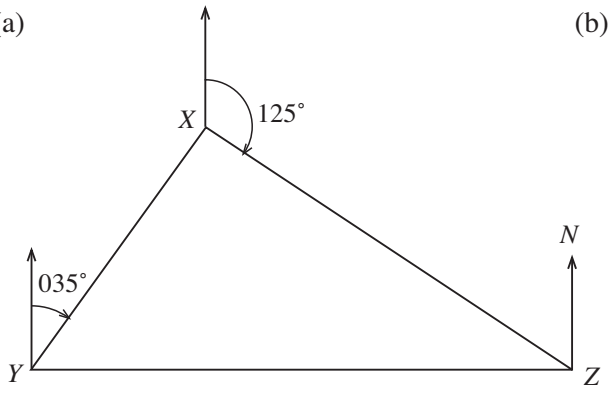
6. (a) 315°, 169 m (b) 203°, 400 km (c) 015°, 545 km
   (d) 043°, 10 km (e) 348°, 8.5 km (f) 015°, 15.5 km
   (g) 350°, 1400 m

7. 188°, 7000 km

8. 5 km on a bearing of 220°

9. (a) (i) 20° (ii) alternate angles (iii) 48°
   (b) (i) 052° (ii) 212° (iii) 312°

10. (a) (b) 90° (c) 55°



11. (a) 103°

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H2.2 Angles and Circles 1

1. (a) $a = 90^\circ$, $b = 65^\circ$

   (b) $a = 72^\circ$, $b = 90^\circ$

   (c) $a = 90^\circ$, $b = 76^\circ$, $c = 90^\circ$, $d = 74^\circ$

   (d) $a = 90^\circ$, $b = 58^\circ$, $c = 90^\circ$, $d = 32^\circ$

   (e) $a = 90^\circ$, $b = 49^\circ$, $c = 60^\circ$, $d = 60^\circ$, $e = 30^\circ$, $f = 30^\circ$, $g = 120^\circ$

   (f) $a = 40^\circ$, $b = 100^\circ$, $c = 50^\circ$, $d = 50^\circ$, $e = 80^\circ$

   (g) $a = 44^\circ$, $b = 44^\circ$, $c = 46^\circ$, $d = 46^\circ$, $e = 88^\circ$, $f = 44^\circ$

   (h) $a = 70^\circ$, $b = 40^\circ$, $c = 140^\circ$, $d = 20^\circ$, $e = 20^\circ$

3. (a) $a = 90^\circ$, $b = 65^\circ$ (b) $a = 74^\circ$ (c) $a = 90^\circ$, $b = 90^\circ$, $c = 50^\circ$, $d = 75^\circ$

   (d) $a = 10^\circ$, $b = 170^\circ$

4. (a) $a = 20^\circ$, $b = 140^\circ$ (b) $a = 25^\circ$, $b = 25^\circ$ (c) $a = 30^\circ$, $b = 120^\circ$

   (d) $a = 100^\circ$, $b = 40^\circ$, $c = 40^\circ$

   (e) $a = 48^\circ$, $b = 84^\circ$, $c = 42^\circ$, $d = 42^\circ$, $e = 96^\circ$

   (f) $a = 75^\circ$, $b = 75^\circ$, $c = 15^\circ$, $d = 15^\circ$, $e = 150^\circ$

   (g) $a = 69^\circ$, $b = 69^\circ$, $c = 42^\circ$, $d = 69^\circ$, $e = 69^\circ$

   (h) $a = 28^\circ$, $b = 124^\circ$, $c = 70^\circ$, $d = 40^\circ$, $e = 16^\circ$

5. (a) $a = 30^\circ$, $b = 70^\circ$, $c = 70^\circ$, $d = 80^\circ$ (b) $a = 110^\circ$, $b = 140^\circ$

   (c) $a = 110^\circ$, $b = 140^\circ$, $c = 40^\circ$, $d = e = f = g = 70^\circ$

   (d) $a = b = 65^\circ$, $c = 60^\circ$, $d = 115^\circ$

6. (a) 5 (b) 7.8 (c) 12 (d) 10

H2.3 Angles and Circles 2

1. (a) 30° (b) 120° (c) $c = d = 35^\circ$ (d) 146°

   (e) $f = 90^\circ$, $g = 55^\circ$ (f) $x = y = 43^\circ$

   (g) $a = 65^\circ$, $b = 25^\circ$, $c = 25^\circ$, $d = 65^\circ$ (h) $a = 27^\circ$, $b = 126^\circ$, $c = 63^\circ$

2. (a) OAB = OBA, BAC = BFC, OGA = OAG, OFC = OCF,
   OCB = OBC, FCB = ACD = GAC

   (b) angles GAC , ACD , BCF

3. (a) $a = 120^\circ$, $b = 75^\circ$ (b) $c = 149^\circ$, $d = 123^\circ$

   (c) $a = 55^\circ$, $b = 125^\circ$ (d) $c = 140^\circ$ (e) $a = 48^\circ$, $b = 75^\circ$

   (f) $a = 75^\circ$, $b = 100^\circ$ (g) $a = 85^\circ$, $b = 30^\circ$ (h) $x = 160^\circ$

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H2.3

4. ABCD and PQR

5. (a) $a = 37^\circ$, $b = 108^\circ$, $c = 37^\circ$ (b) $a = 30^\circ$, $b = c = 75^\circ$, $d = 60^\circ$, $e = 30^\circ$
   (c) $a = 32.5^\circ$, $b = 147.5^\circ$ (d) 34°

6. (a) 50° (b) 22.5° (c) 40°

7. Let $D\hat{C}B = C\hat{B}D = x$
   and $B\hat{D}C = y$
   So $x + x + y = 180^\circ$ (x)
   But $C\hat{A}B = y$
   $C\hat{A}D = x$
   and $P\hat{A}D = 180 - (x + y)$
   $= x$, using (x) above
   Thus $C\hat{A}D = P\hat{A}D$ and AD bisects $C\hat{A}P$.

8. As PQR is isosceles, then OQ is the perpendicular bisector of PR.
   $P\hat{O}Q = 2 \times P\hat{R}Q = 2x$ if $P\hat{R}Q = x$
   $P\hat{Q}O = 2x$ (isosceles Δ)
   $R\hat{Q}O = 2x$ (symmetry)
   $= P\hat{O}Q$
   and PO is parallel to QR.

9. $x = 94^\circ$, $y = 28^\circ$, $z = 19^\circ$

10. (a) x (b) $90 - x$ (c) x (d) $2x$

11. (a) $x = 45^\circ$, $y = 45^\circ$ (b) Angles in *ABCD* are all right angles and sides equal.

12. (a) 32° (b) 38° (c) 38° (d) 52°

H2.4 Circles and Tangents

1. (a) 40° (b) $b = 55^\circ$, $c = 35^\circ$ (c) $a = b = c = 70^\circ$
   (d) $a = 11^\circ$, $b = 79^\circ$, $c = 79^\circ$, $d = 22^\circ$ (e) $a = 52^\circ$, $b = 104^\circ$
   (f) $a = b = c = 24^\circ$, $d = 62^\circ$

2. (a) 4.8 (b) $\frac{8}{3}$ (c) $x = 3.9$, $y = 4$ (d) $x = 7$, $y = 3.5$
   (e) $x = 4$, $y = 6$ (f) $x = 3$, $y = 2$

3. (c) 6

4. (b) 30°

5. $a = 74^\circ$, $b = 36^\circ$, $c = 32^\circ$

6. (a) $x = 65^\circ$ (b) $y = 130^\circ$ (c) $z = 50^\circ$

7. (a) 90° (b) 90° (c) 50° (d) 50°

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