# **Revision answers: Geometry (Topics 3 & 4)**

**Coursebook chapters: 8–11**

**1. **(52)(1.2 – sin 1.2) = 3.35 cm2 *[4 marks]*

**2.** tan (2*θ***)** = , 0 ≤ 2*θ* ≤ 360°

 = 60°

⇒ 2*θ* = 60° or 60 + 180 = 240°

⇒ *θ* = 30°, 120° *[5 marks]*

**3. **



∴  = 7°





∴  = 156°

 = 180 – 7 – 156 = 17° *[9 marks]*

**4. **

 = 0.895

∴  = 63.5° or 180 – 63.5 = 116.5° *[5 marks]*

**5.** amplitude =  = 3.5 ∴ *A* = 3.5

*B* =  = 1.5

half-period =  = 3 *[5 marks]*

**6.** 2*x* + 30 ∈ [30, 750]; 2*x* + 30 = 60, 300, 420, 660 ∴ *x* = 15, 135, 195, 315 *[5 marks]*

**7.** (a) (1 – 2 sin2 *x*) – 3 sin *x* + 1 = 0 ⇔ 2 sin2 *x* + 3 sin *x* – 2 = 0

(b) sin *x* = ∴ *x* =  *[7 marks]*

**8.** Cosine rule: (2*x* + 1)2 = (*x* + 1)2 + (*x* + 3)2 – 2(*x* + 1)(*x* + 3)

⇒ *x*2 – 8*x* – 12 = 0

∴ *x* = 9.29 *[6 marks]*

**9.** (a) Write BC = 5*x*, AC = 4*x*, then:

 ⇒  ⇒ 8 cos *θ* = 5 (as sin *θ* ≠ 0)

∴ *θ* = 51.3°

(b) 51.3°, 103°, 26.0° *[6 marks]*

**10.** (a) ***r*** = *t*

(b) (8, −2, −4)

(c) cos *θ* =  = −0.106 ∴ *θ* = 96.1°

(d) AB =  = , distance = sin(180 – 96.1) = 4.56 *[12 marks]*

**11.** (a)  = 0

⇔ cos2 *θ* – sin2 θ − sin θ cos *θ* = 0

⇔ cos 2*θ* − sin 2*θ* =

⇔ 2cos 2*θ* = sin 2*θ*

⇔ tan 2*θ* = 2

(b)  = 2

⇔ 2 tan2 *θ* + 2 tan *θ* – 1 = 0

⇔ tan *θ* 

*θ* ∈  ⇒ tan *θ* > 0

∴ tan *θ* = *[9 marks]*