**Self-assessment answers: 9 Circular measure and trigonometric functions**

**1.** (a) *a* = 2, *b* = 3

(b) *c* = 3, *d* = 60*[7 marks]*

**2.** Period of sin 4*x* is 90°, period of sin 6*x* is 60°.

Period of the overall function is the LCM of the constituent periods − that is, 180° (π radians).

*[3 marks]*

**3.** (a) *h*(14) = 9.64 metres(GDC)

(b) 7.4 metres

(c) *h*(*t*) = 8.1 ⇒ *t* = 6.82, 11.18, 18.82, 23.18 (GDC)

These correspond to times 06:49, 11:11, 18:49 and 23:11 on the 24 hour clock.

(d) *h*(*t*) > 9 ⇒ *t* ∈ [0.649, 5.351] ∪ [12.649, 17.351]

These intervals correspond to periods 00:39 to 05:21 and 12:39 to 17:21*[8 marks]*

**4.** (a) 

(b) 

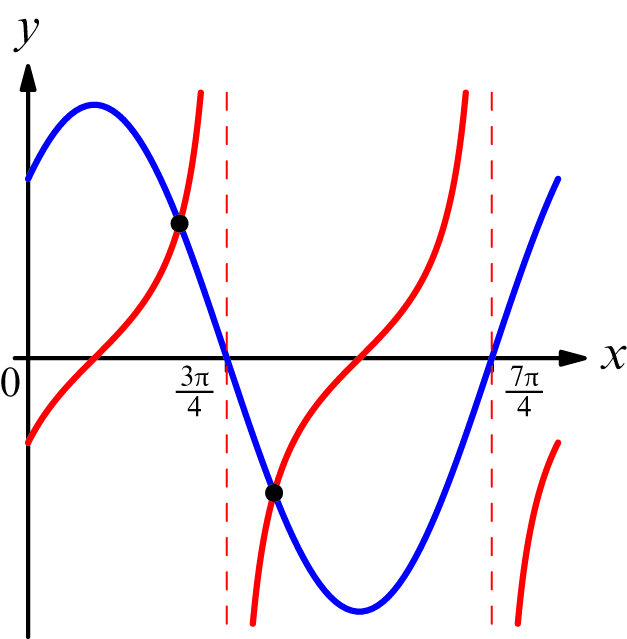




(c) *f* (*x*) takes values in [−3, 3], so the minimum value of 5 – *f* (*x*) is 2.

(d) 

(e)



2 solutions*[12 marks]*