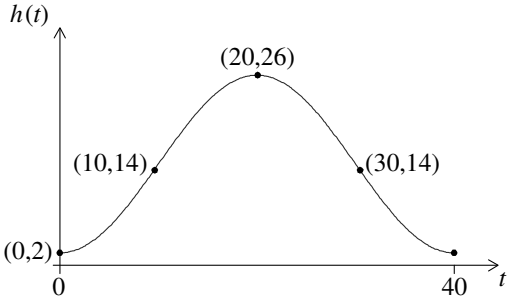
QUESTION 5.3 ***Units not required in this question***

(a) (i) 14 m ***(A1)***

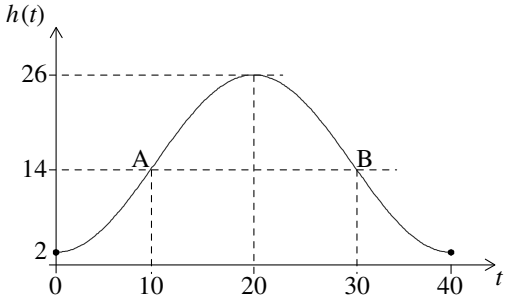
(ii) 26 m ***(A1)*** ***[2 marks]***

(b) A:10, B:30 ***(A1)(A1)*** ***[2 marks]***

(c)



OR



(A1)**(ft)*****(A1)*****(ft)*****(A1)*****(ft)*****(A1)*****(ft)** ***[4 marks]***

Note: Award ***(A1)*****(ft)** for coordinates of each point clearly indicated either by scale or by coordinate pairs. Points need not be labelled A and B in the second diagram.
Award a maximum of ***(A1)(A0)(A1)*****(ft)*****(A1)*****(ft)** if coordinates are reversed. Do not penalise reversed coordinates if this has already been penalised in Q4(a)(iii).

(d) (i) $a = -12$ ***(A2)*****(ft)**

Note: Follow through from (a) even if no working seen.

(ii) $b = \frac{360}{40}$ ***(M1)***

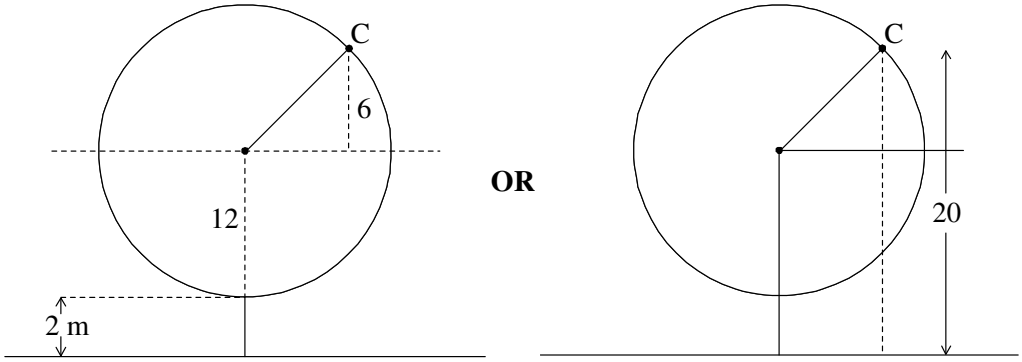
$= 9$ ***(A1)(G2)***

(iii) $c = 14$ ***(A1)*** ***[5 marks]***

continued…

Question 5.3 continued

(e) (i)



(A1)(A1)

Note: Award ***(A1)*** for C in correct quadrant, ***(A1)*** for clear indication of 20 m above ground.

(ii) $90 + \sin^{-1}\left(\frac{6}{12}\right)$ ***(M1)(M1)***

Note: Award ***(M1)*** for adding 90, ***(M1)*** for use of trigonometric ratio with appropriate values.

$= 120^\circ$ ***(A1)(G2)***

OR

$20 = -12\cos(9T) + 14$ ***(M1)(M1)***

Note: Award ***(M1)*** for substituting values, ***(M1)*** for equating to 20.

$9T = 120^\circ$ ***(A1)*ft*(G2)**

Note: Follow through from their a, b and c in part (d). The final answer must be an obtuse angle. $9T$ does not have to be seen.

(iii) $\frac{120}{360} \times 40$ ***(M1)***

$= 13\frac{1}{3}$ seconds (13.3333…) ***(A1)*(ft)*(G2)**

OR

$9T = 120^\circ$ ***(M1)***

$T = 13\frac{1}{3}$ ***(A1)*(ft)*(G2)*** ***[7 marks]***

Notes: Follow through from their answer to part (e)(ii).
The final answer must be consistent with their diagram. Accept 13.

Total *[20 marks]*