

Daily Questions Pure Maths Day 7 Mark Scheme

Question Number	Scheme	Marks
(a)	$R = \sqrt{109}$ $\tan \alpha = \frac{3}{10} \Rightarrow \alpha = \text{awrt } 16.70^\circ$	B1 M1A1 (3)
(b)(i) (ii)	Max height = $12 + \sqrt{109} = 22.44 \text{ m}$ Occurs when $30t + 16.70 = 180 \Rightarrow t = 5.44$	M1A1 M1A1 (4)
(c)	$18 = 12 - \sqrt{109} \cos(30t + 16.70) \Rightarrow \cos(30t + 16.70) = -\frac{6}{\sqrt{109}} \quad (-0.57..)$ $\Rightarrow 30t + 16.70 = \arccos\left(-\frac{6}{\sqrt{109}}\right) \Rightarrow t = ..$ $t = \text{awrt } 3.61 (2\text{dp})$	M1A1 dM1 A1 (4)
(d)	Attempting $30t = 360 \Rightarrow t = ..$ or $30t = 720 \Rightarrow t = ..$ 2 revolutions in 24 minutes	M1 A1 (2) (13 marks)