Question Number	Answer	Mark	Additional Guidance
7a	Max speed: $a\omega = 12$	B1	Seen or implied
	$\left(4\sqrt{5}\right)^2 = \omega^2\left(a^2 - 2^2\right)$	B1	Correct use of $v^2 = \omega^2\left(a^2 - x^2\right)$
	Solve for a	M1	(N.B. $\omega = 4$)
	$a = 3$	A1	
		(4)	
7b	$A = a\omega^2 = 48$	B1ft	Follow their a, ω. May use $\frac{v_{\max}^2}{a}$. Do not need to see "A="
		(1)	
7c	Use $\ddot{x} = -A\cos\omega t$ or $\ddot{x} = -A\sin\omega t$ $\left(\frac{1}{2}A = \pm A\cos\omega t \text{ or } \frac{1}{2}A = \pm A\sin\omega t\right)$	M1	Or equivalent e.g. $x = a\cos\omega t$ and $\frac{1}{2}A = -\omega^2 x$ (N.B. $x = \pm\frac{3}{2}$)
	$4t = \cos^{-1}\frac{1}{2} \Rightarrow t = \frac{\pi}{12}$ or $4t = \sin^{-1}\frac{1}{2} \Rightarrow t = \frac{\pi}{24}$	A1	Obtain a relevant value of t (allow for an inequality)
	$\frac{2\pi}{\omega} - 4\times\frac{\pi}{12}$ or $4\times\frac{\pi}{24}$	M1	Complete method to obtain the required time
	$\frac{\pi}{6}$ (s)	A1	0.52 (s) or better (0.52359 …)
		(4)	
		(9)	