Question	Scheme	Marks
number		
6 (a)	$\left[V = \frac{1}{3}\pi r^2 h\right]$	
	$\tan 30^{\circ} = \frac{r}{h} \Rightarrow r = \frac{h}{\sqrt{3}}$	M1
	$V = \frac{1}{3}\pi \left(\frac{h}{\sqrt{3}}\right)^2 h \Rightarrow V = \frac{1}{9}\pi h^3 *$	A1 cso [2]
(b)	$\frac{\mathrm{d}V}{\mathrm{d}h} = \frac{\pi h^2}{3}$	M1
	$\frac{dh}{dt} = \frac{dh}{dV} \times \frac{dV}{dt} \Rightarrow \frac{dh}{dt} = \frac{3}{\pi h^2} \times -0.9 = \frac{3}{\pi \times 1.2^2} \times -0.9 = -0.59683$ $\approx -0.597 \text{ cm/s}$ [Accept an answer of $\pm 0.597 \text{ cm/s}$]	M1M1 A1 [4]
	Total 6 marks	
(a)		tai o mai ks
M1	Finding $r = \frac{h}{\sqrt{3}}$ and substituting into $V = \frac{1}{3}\pi r^2 h$ (Allow $r = h \tan 30^\circ$)	
A1 cso	Obtains the given answer with no errors in the working	
(b)	South the grown with he strong in the working	
M1	$\frac{\mathrm{d}V}{\mathrm{d}h} = \frac{\pi h^2}{3}$	
M1	$\frac{\mathrm{d}h}{\mathrm{d}t} = \frac{\mathrm{d}h}{\mathrm{d}V} \times \frac{\mathrm{d}V}{\mathrm{d}t}$	
M1	$\frac{\mathrm{d}h}{\mathrm{d}t} = \frac{3}{\pi h^2} \times \pm 0.9$	
A1	$\pm 0.597 \text{ (cm/s)}$	