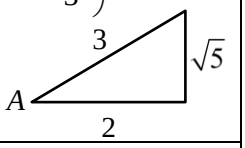
Question	Answer	Marks	Guidance
7(b)	$3\sin^2 x - \sin x - 2 \quad [=0]$ soi	**B1**	
	$(3\sin x + 2)(\sin x - 1)$ [= 0] oe	**M1**	
	$\sin x = -\frac{2}{3}$, $\sin x = 1$	**A1**	
	90 221.8 or 221.81[03…] rot to 2 or more dp 318.2 or 318.18[96…] rot to 2 or more dp	**A1**	and no extras in range If **B1 M1 A0 A0** allow **SC1** for 221.8 or 221.81[03…] rot to 2 or more dp **and** 318.2 or 318.18[96…] rot to 2 or more dp and no extras in range
8(a)	$2\pi rh + 2\pi r^2 + \pi r^2$ [= 300] oe	**M1**	
	$h = \frac{300 - 3\pi r^2}{2\pi r}$ oe, isw	**A1**	
8(b)	$V = \pi r^2\left(\textit{their}\ \frac{300 - 3\pi r^2}{2\pi r}\right) + \frac{2}{3}\pi r^3$ oe	**M2**	**FT** *their h* providing in terms of *r* and derived from a dimensionally correct equation in **(a)**; **M1** for $V = \pi r^2\left(\textit{their}\ \frac{300 - 3\pi r^2}{2\pi r}\right) + k\pi r^3$, $k \neq \frac{2}{3}$ oe
	Correct completion to given answer: $150r - \frac{5}{6}\pi r^3$ nfww	**A1**	
8(c)	Derivative of V: $150 - \frac{5}{2}\pi r^2$ oe, soi, isw	**B1**	
	$\textit{their}\left(150 - \frac{5}{2}\pi r^2\right) = 0$ and solves as far as r = …	**M1**	**FT** $\textit{their}\ \frac{\mathrm{d}V}{\mathrm{d}r}$ providing that at least one term is correct
	$r = \sqrt{\frac{300}{5\pi}}$ oe or 4.37 (cm)	**A1**	
	$150(\textit{their}\,4.37) - \frac{5}{6}\pi(\textit{their}\,4.37)^3$	**M1**	**FT** *their* 4.37
	437 or awrt 437 (cm^3) isw	**A1**	

Question	Answer	Marks	Guidance
9(a)	$\frac{1}{2}(\sqrt{5}-1)(\sqrt{5}+1)\sin A = \frac{2\sqrt{5}}{3}$	**M1**	OR $\frac{1}{2}\times(\sqrt{5}+1)\times \text{height} = \frac{2\sqrt{5}}{3}$ **and** $\sin A = (\textit{their}\ \text{height}) \div (\sqrt{5}-1)$
	Simplifies to $\frac{1}{2}\times(5-1)\times\sin A = \frac{2\sqrt{5}}{3}$ oe	**A1**	OR $\sin A = \frac{4\sqrt{5}}{3(\sqrt{5}+1)} \div (\sqrt{5}-1)$ or $\sin A = \frac{5-\sqrt{5}}{3} \div (\sqrt{5}-1)$
	$\frac{\sqrt{5}}{3}$ isw	**A1**	
9(b)	$\cos A = \frac{2}{3}$ or exact equivalent	**B2**	**B1** for $\cos A = \sqrt{1-\textit{their}\left(\frac{\sqrt{5}}{3}\right)^2}$ or for $\cos A = \cos\left(\sin^{-1}\frac{\sqrt{5}}{3}\right)$ or for a sketch 
	$(\sqrt{5}-1)^2 + (\sqrt{5}+1)^2$ $-2(\sqrt{5}-1)(\sqrt{5}+1)\times\cos A$ soi	**M1**	
	$(\sqrt{5}-1)^2 + (\sqrt{5}+1)^2$ $-2(\sqrt{5}-1)(\sqrt{5}+1)\times\frac{2}{3}$ soi	**A1**	
	$x = \sqrt{\frac{20}{3}}$ or $\frac{2}{3}\sqrt{15}$ or $2\sqrt{\frac{5}{3}}$ oe, isw	**A1**	