Question	Answer	Marks	Partial Marks
12(a)	$\frac{PQ}{8}=\frac{12-h}{12}$ oe or $\left(\frac{12-h}{12}\right)^2=\frac{\text{Area }\Delta PQR}{16\sqrt{3}}$ oe	**M1**	
	$PQ=\frac{8(12-h)}{12}$ oe or Area $\Delta PQR=16\sqrt{3}\left(\frac{12-h}{12}\right)^2$ oe	**A1**	
	$V=\frac{1}{2}\times\left(\frac{8(12-h)}{12}\right)^2\times\sin\frac{\pi}{3}\times h$ oe or $16\sqrt{3}\left(\frac{12-h}{12}\right)^2\times h$	**M1**	**FT** *their PQ* or Area ΔPQR providing of correct structure
	$V=\frac{\sqrt{3}}{9}(h^3-24h^2+144h)$	**A1**	
12(b)	$\frac{\mathrm{d}V}{\mathrm{d}h}=\frac{\sqrt{3}}{9}(3h^2-48h+144)$	**B1**	**FT** *their* $V=\frac{\sqrt{3}}{9}(h^3-24h^2+144h)$ if of the same structure
	their $\frac{\sqrt{3}}{9}(3h^2-48h+144)=0$ and factorises/solves	**M1**	must be a 3-term quadratic; must be an attempt at a derivative
	4 oe identified as the only solution; cao	**A1**	