Question	Answer	Marks	Partial Marks
8(d)	Forms $\overrightarrow{AB}$ or $\overrightarrow{BA}$ when $t = 1$ e.g. $\overrightarrow{BA} = (32\mathbf{i} + (16 - 9\sqrt{3})\mathbf{j}) - (29\mathbf{i} + (16 - 12\sqrt{3})\mathbf{j})$ oe	**B1**	**FT** *their* (b) and (c) with $t = 1$
	$\sqrt{3^2 + (3\sqrt{3})^2}$	**M1**	**FT** *their* $\overrightarrow{AB}$ or $\overrightarrow{BA}$
	6 (km)	**A1**	cao
9(a)	$h = \sqrt{x^2 - \left(\frac{x}{2}\right)^2}$ oe or $\cos 30 = \frac{h}{x}$ oe or $\frac{1}{2}xh = \frac{1}{2}x^2 \sin 60$	**M1**	Correct expression connecting x and h
	$x = \frac{2h}{\sqrt{3}}$ oe	**A1**	Must be $x =$
	$V = \frac{1}{2} \times \left(their \frac{2h}{\sqrt{3}}\right)^2 \times \sin 60° \times 5$ or $\frac{1}{2} \times h \times their \frac{2h}{\sqrt{3}} \times 5$	**M1**	
	Correct completion to given answer $V = \frac{5\sqrt{3}h^2}{3}$	**A1**	
9(b)	Correct derivative of V e.g. $\frac{10\sqrt{3}}{3}h$	**B1**	
	$\frac{dh}{dt} = \frac{dV}{dt} \times \frac{dh}{dV}$ soi	**B1**	Not $\frac{\partial V}{\partial h}$
	$0.5 \div \left(\frac{10\sqrt{3}}{3} \times 0.1\right)$ oe	**M1**	
	0.866 (metres per minute) or 0.8660[25…] rot to 4 or more sf	**A1**	Allow $\frac{\sqrt{3}}{2}$ isw
10(a)	$\ln x - 1$	**B2**	**B1** for $[1\times]\ln x + x \times \frac{1}{x}[-2]$ oe