Question	Answer	Marks	Partial Marks
5(a)	Solves $3e^x + 3e^y = 15$ and $2e^x - 3e^y = 8$ oe by elimination as far as $3e^x + 2e^x = 23$ or substitutes $e^y = 5 - e^x$ into $2e^x - 3e^y = 8$ oe OR Solves $2e^x + 2e^y = 10$ and $2e^x - 3e^y = 8$ oe by elimination as far as $2e^y + 3e^y = 2$ or substitutes $e^x = 5 - e^y$ into $2e^x - 3e^y = 8$ oe	**M1**	
	$e^x = \frac{23}{5}$ or $e^y = \frac{2}{5}$ oe	**A1**	
	$x = \ln 4.6 [= 1.53]$ oe or $y = \ln 0.4 [= -0.916]$ oe	**A1**	If M0 scored **SC1** for using *their* expression of the form $ce^x = d$ to give $x = \ln\frac{d}{c}$ provided $\frac{d}{c} > 0$
	Finds the other value, e^y or e^x, by substituting *their* e^x or e^y	**M1**	**FT** *their* e^x or e^y
	$y = \ln 0.4 [= -0.916]$ oe or $x = \ln 4.6 [= 1.53]$ oe	**A1**	

Question	Answer	Marks	Partial Marks
5(b)	$e^{2t-1-(5t-3)}=5$ or $e^{5t-3-(2t-1)}=\frac{1}{5}$ oe	**M1**	
	$e^{2-3t}=5$ or $e^{3t-2}=\frac{1}{5}$	**A1**	
	$2-3t=\ln 5$ or $3t-2=\ln\frac{1}{5}$	**M1**	**FT** *their* $e^{a-bt}=5$ or *their* $e^{ct-d}=\frac{1}{5}$ where a, b, c and d are positive integers
	$t=\frac{2-\ln 5}{3}$ or $t=\frac{2+\ln 0.2}{3}$ or 0.13[0] oe	**A1**	
	Alternative method		
	$\ln e^{2t-1}=\ln 5+\ln e^{5t-3}$ oe	**(M1)**	
	$(2t-1)[\ln e]=\ln 5+(5t-3)[\ln e]$ oe	**(A1)**	
	$5t-2t=3-1-\ln 5$ oe	**(M1)**	**Dep** on one correct log law applied with at most one sign error
	$t=\frac{2-\ln 5}{3}$ or $t=\frac{2+\ln 0.2}{3}$ or 0.13[0] oe	**(A1)**	
6(a)	$\left(\sqrt{6}-\sqrt{2}\right)^2+\left(\sqrt{6}+\sqrt{2}\right)^2-2\left(\sqrt{6}-\sqrt{2}\right)\left(\sqrt{6}+\sqrt{2}\right)\cos 60$	**M1**	
	$6+2-2\sqrt{12}+6+2+2\sqrt{12}-2\times(6-2)\times\frac{1}{2}$	**M1**	Condone one error in expansion of brackets
	$[BC=]2\sqrt{3}$ isw	**A1**	
6(b)	$\frac{\textit{their}\,2\sqrt{3}}{\sin 60}=\frac{\sqrt{6}+\sqrt{2}}{\sin ACB}$ or $\frac{\textit{their}\,2\sqrt{3}}{\frac{\sqrt{3}}{2}}=\frac{\sqrt{6}+\sqrt{2}}{\sin ACB}$	**M1**	Condone other letters for ACB
	$\sin ACB=\left(\sqrt{6}+\sqrt{2}\right)\times\frac{\sqrt{3}}{2}\times\frac{1}{2\sqrt{3}}=\frac{\sqrt{6}+\sqrt{2}}{4}$	**A1**	**A0** if necessary brackets missing unless clearly recovered