Question Number	Scheme	Notes	Marks
6(a)	$\mathbf{A}=\begin{pmatrix}1 & -1 & 1\\ 1 & 1 & 1\\ 1 & 2 & a\end{pmatrix}$		
	$\lvert\mathbf{A}\rvert = a-2+a-1+2-1\left(=2a-2\right)$	Correct determinant in any form	B1
	$\begin{pmatrix}1 & -1 & 1\\ 1 & 1 & 1\\ 1 & 2 & a\end{pmatrix}\rightarrow\begin{pmatrix}a-2 & a-1 & 1\\ -a-2 & a-1 & 3\\ -2 & 0 & 2\end{pmatrix}\rightarrow\begin{pmatrix}a-2 & 1-a & 1\\ a+2 & a-1 & -3\\ -2 & 0 & 2\end{pmatrix}$ Applies the correct method to reach at least a matrix of cofactors 2 correct rows or 2 correct columns needed		M1
	$\begin{pmatrix}a-2 & 1-a & 1\\ a+2 & a-1 & -3\\ -2 & 0 & 2\end{pmatrix}\rightarrow\begin{pmatrix}a-2 & a+2 & -2\\ 1-a & a-1 & 0\\ 1 & -3 & 2\end{pmatrix}$ Correct transpose of cofactors		A1
	$\mathbf{A}^{-1}=\frac{1}{2a-2}\begin{pmatrix}a-2 & a+2 & -2\\ 1-a & a-1 & 0\\ 1 & -3 & 2\end{pmatrix}$	Correct inverse	A1
			(4)
(b)	$a=4\Rightarrow\mathbf{A}^{-1}=\frac{1}{6}\begin{pmatrix}2 & 6 & -2\\ -3 & 3 & 0\\ 1 & -3 & 2\end{pmatrix}$	Correct inverse (follow through their matrix from (a))	B1ft
	$=\frac{1}{6}\begin{pmatrix}2 & 6 & -2\\ -3 & 3 & 0\\ 1 & -3 & 2\end{pmatrix}\begin{pmatrix}12-6\lambda\\ 4+2\lambda\\ 6+3\lambda\end{pmatrix}=\ldots$	Attempt to multiply the parametric form of l_2 by their inverse	M1
	$=\begin{pmatrix}6-\lambda\\ -4+4\lambda\\ 2-\lambda\end{pmatrix}$	Correct parametric form	A1
	$\mathbf{r}=\begin{pmatrix}6\\ -4\\ 2\end{pmatrix}+\lambda\begin{pmatrix}-1\\ 4\\ -1\end{pmatrix}$	Correct equation (allow equivalent forms) but if given as l = ... award A0	A1
			(4)
			Total 8

	Alternatives for (b)		
(i)	$a=4 \Rightarrow \mathbf{A}^{-1}=\frac{1}{6}\begin{pmatrix}2 & 6 & -2\\ -3 & 3 & 0\\ 1 & -3 & 2\end{pmatrix}$	Correct inverse (follow through their matrix from (a))	B1ft
	$\frac{1}{6}\begin{pmatrix}2 & 6 & -2\\ -3 & 3 & 0\\ 1 & -3 & 2\end{pmatrix}\begin{pmatrix}12\\ 4\\ 6\end{pmatrix}=\frac{1}{6}\begin{pmatrix}36\\ -24\\ 12\end{pmatrix}$ $\frac{1}{6}\begin{pmatrix}2 & 6 & -2\\ -3 & 3 & 0\\ 1 & -3 & 2\end{pmatrix}\begin{pmatrix}-6\\ 2\\ 3\end{pmatrix}=\frac{1}{6}\begin{pmatrix}-6\\ 24\\ -6\end{pmatrix}$	Attempt $\mathbf{A}^{-1}$(point on l_2) **and** $\mathbf{A}^{-1}$(direction of l_2) **Both** correct (NB No ft)	M1 A1
	$\mathbf{r}=\begin{pmatrix}6\\ -4\\ 2\end{pmatrix}+\lambda\begin{pmatrix}-1\\ 4\\ -1\end{pmatrix}$	Correct equation (allow equivalent forms) but if given as l = ... award A0	A1
			(4)
(ii)	$a=4 \Rightarrow \mathbf{A}^{-1}=\frac{1}{6}\begin{pmatrix}2 & 6 & -2\\ -3 & 3 & 0\\ 1 & -3 & 2\end{pmatrix}$	Correct inverse (follow through their matrix from (a))	B1ft
	$\frac{1}{6}\begin{pmatrix}2 & 6 & -2\\ -3 & 3 & 0\\ 1 & -3 & 2\end{pmatrix}\begin{pmatrix}12\\ 4\\ 6\end{pmatrix}=\frac{1}{6}\begin{pmatrix}36\\ -24\\ 12\end{pmatrix}$ $\frac{1}{6}\begin{pmatrix}2 & 6 & -2\\ -3 & 3 & 0\\ 1 & -3 & 2\end{pmatrix}\begin{pmatrix}6\\ 6\\ 9\end{pmatrix}=\frac{1}{6}\begin{pmatrix}30\\ 0\\ 6\end{pmatrix}$	Attempt $\mathbf{A}^{-1}$(point on l_2) for 2 points **Both** correct (NB No ft)	M1 A1
	$\mathbf{r}=\begin{pmatrix}6\\ -4\\ 2\end{pmatrix}+\lambda\begin{pmatrix}-1\\ 4\\ -1\end{pmatrix}$	Obtain the direction vector and deduce correct equation (allow equivalent forms) but if given as l = ... award A0	A1
			(4)