Question Number	Scheme	Marks
6(a)	$\mathbf{A}=\begin{pmatrix}1 & k & 2\\ 5 & 3 & -2\\ 6 & -1 & 4\end{pmatrix}$	
	$\lvert\mathbf{A}\rvert = 12-2-k(20+12)+2(-5-18)$ (via first row) $\lvert\mathbf{A}\rvert = 12-2-5(4k+2)+6(-2k-6)$ (via first column) $\lvert\mathbf{A}\rvert = 12-12k-10-36-2-20k$ (Sarrus)	M1
	$\lvert\mathbf{A}\rvert = 0 \Rightarrow 10-32k-46=0 \Rightarrow k=...$	M1
	$k=-\frac{9}{8}$	A1
		(3)
(b)	$\begin{pmatrix}1 & k & 2\\ 5 & 3 & -2\\ 6 & -1 & 4\end{pmatrix} \rightarrow \begin{pmatrix}10 & 32 & -23\\ 4k+2 & -8 & -1-6k\\ -2k-6 & -12 & 3-5k\end{pmatrix} \rightarrow \begin{pmatrix}10 & -32 & -23\\ -4k-2 & -8 & 6k+1\\ -2k-6 & 12 & 3-5k\end{pmatrix}$	M1A1
	$\begin{pmatrix}10 & -32 & -23\\ -4k-2 & -8 & 6k+1\\ -2k-6 & 12 & 3-5k\end{pmatrix} \rightarrow \begin{pmatrix}10 & -4k-2 & -2k-6\\ -32 & -8 & 12\\ -23 & 6k+1 & 3-5k\end{pmatrix}$ $\mathbf{A}^{-1}=\frac{-1}{32k+36}\begin{pmatrix}10 & -4k-2 & -2k-6\\ -32 & -8 & 12\\ -23 & 6k+1 & 3-5k\end{pmatrix}$	**d**M1A1
		(4)
		Total 7

Notes

(a)

M1: Correct determinant attempt. This may be along any row or down any column, or via a "shoelace" approach (rule of Sarrus). Condone sign slips, but the overall structure should be correct.

M1: Sets their linear expression for the determinant = 0 and solves for k

A1: Correct value

(b)

M1: Applies the correct method to reach at least a matrix of cofactors. Two correct rows or two correct columns needed. This may be implied by the transpose of their cofactor matrix, if the cofactor matrix is not seen, with at least two correct rows or two correct columns.

A1: Correct cofactor matrix

dM1: Transposes their cofactor matrix and divides by their determinant. **Depends on previous method mark**. If the candidate miscopies one element from their cofactor matrix, then allow this mark.

A1: Correct matrix. Allow any equivalent correct simplified matrix.

Note: a correct matrix of minors followed by a fully correct answer scores M1A1dM1A1