Question	Scheme	Marks
1.(a)	$\begin{pmatrix} 2 & -1 & 3 \\ -2 & 3 & 0 \end{pmatrix}\begin{pmatrix} 1 & k \\ 0 & -3 \\ 2k & 2 \end{pmatrix}=\begin{pmatrix} 2+0+6k & 2k+3+6 \\ -2+0+0 & -2k-9+0 \end{pmatrix}$	**M1**
	$=\begin{pmatrix} 2+6k & 2k+9 \\ -2 & -2k-9 \end{pmatrix}$	**A1cao**
		(2)
(b)	$\det \mathbf{AB}=(2+6k)(-2k-9)-(-2)(2k+9)$	**M1**
	$\det \mathbf{AB}=0 \Rightarrow -12k^2-54k=0 \Rightarrow k=...$	**dM1**
	$k=-\frac{9}{2}$	**A1**
		(3)
		(5 marks)

Notes:

(a)

M1: Obtains a 2×2 matrix with at least two entries correct, unsimplified.

A1cao: Correct matrix with terms simplified.

(b)

M1: Attempts the determinant, be tolerant of minor slips, such as sign slips with the negatives, if the correct "*ad* – *bc*" form is apparent. They may give the $-(-2)(\ldots)$ as just + 2(…). Accept if seen as part of the attempt at the inverse matrix.

dM1: Expands their determinant to a **quadratic**, sets equal to zero (may be implied) and achieves a value for *k* via correct method (allow if a factor *k* is cancelled, use of formula or calculator (a correct value for their quadratic)).

A1: cso for $-\frac{9}{2}$. Accept as decimal or equivalent fractions, such as $-\frac{54}{12}$. Ignore any reference to the 0 solution.