Number	Scheme	Notes	Marks
1	$\mathbf{C} = 3\mathbf{A} + 2\mathbf{B} = 3\begin{pmatrix} 2 & 4 \\ 3 & 1 \end{pmatrix} + 2\begin{pmatrix} 1 & k \\ 5 & 3k \end{pmatrix}$ Condone any type of brackets (or even missing brackets) for matrices		
(a)	$\mathbf{C} = 3\mathbf{A} + 2\mathbf{B} = \begin{pmatrix} 6 & 12 \\ 9 & 3 \end{pmatrix} + \begin{pmatrix} 2 & 2k \\ 10 & 6k \end{pmatrix}$ $= \begin{pmatrix} 8 & 12+2k \\ 19 & 3+6k \end{pmatrix}$	B1: Any 2 correct elements (terms collected but could be factorised) **d**B1: Fully correct **C** (terms collected but could be factorised)	**B1** **dB1**
			(2)
(b)	$\lvert\mathbf{C}\rvert = 8(3+6k) - 19(12+2k)$ $\{= 24 + 48k - 228 - 38k = 10k - 204\}$	**Correct** determinant explicitly seen (may be unsimplified but if only seen with the brackets multiplied out this must be done correctly) **for their C** of the correct form i.e., $\begin{pmatrix} a & b+ck \\ d & e+fk \end{pmatrix}$ $a,b,c,d,e,f \in \mathbb{Z}^+$ Note that this mark cannot be scored in (c). If parts are unlabelled mark in the order presented. If there is any doubt look for using the determinant to find k	**M1**
	$\lvert\mathbf{C}\rvert = 0 \Rightarrow 8(3+6k) - 19(12+2k) = 0 \Rightarrow k = ...$ Finds a value for k following an attempt to apply $\lvert\mathbf{C}\rvert = 0$ with their **C** which must have had at least 1 term in k. **Allow slips here** (e.g., errors multiplying out brackets which they may do immediately) provided there is a recognisable attempt at $ad - bc = 0$ Note this mark is not dependent on the previous method mark.		**M1**
	$\{k =\} \frac{102}{5}, 20\frac{2}{5}, 20.4$	Correct value. Any equivalent e.g., $\frac{204}{10}$	**A1**
			(3)
(c)	$\mathbf{C}^{-1} = \frac{1}{10k - 204}\begin{pmatrix} 3+6k & -12-2k \\ -19 & 8 \end{pmatrix}$ oe e.g., $\begin{pmatrix} \frac{3(1+2k)}{2(5k-102)} & \frac{-6-k}{5k-102} \\ \frac{-19}{2(5k-102)} & \frac{8}{2(5k-102)} \end{pmatrix}$	M1: Award for a completed attempt at $\frac{1}{\text{their}\lvert\mathbf{C}\rvert} \times (\text{A } \textbf{changed } \textit{their } \mathbf{C})$ $\lvert\mathbf{C}\rvert$ must be a 2 term linear function of k although there may have been slips when simplifying and they may reattempt the determinant **OR** sight of a correct ft Adj(their **C**) ignoring any determinant (it could be missing) provided **C** had at least one term in k A1: Fully correct inverse in simplest form (terms collected). Not ft. Elements/determinant may be factorised. Isw once a correct inverse is seen. Remember that ISW applies throughout this paper.	**M1** **A1**
			(2)
			(Total 7 marks)