Question Number	Scheme	Marks
6.(a)	$\det \mathbf{A} = 2p(5q) - 3p(3q)$	B1
	$\begin{pmatrix} 2p & 3q \\ 3p & 5q \end{pmatrix} \rightarrow \begin{pmatrix} 5q & -3q \\ -3p & 2p \end{pmatrix}$	M1
	$\mathbf{A}^{-1} = \frac{1}{pq}\begin{pmatrix} 5q & -3q \\ -3p & 2p \end{pmatrix}$ or $\mathbf{A}^{-1} = \begin{pmatrix} \frac{5}{p} & -\frac{3}{p} \\ -\frac{3}{q} & \frac{2}{q} \end{pmatrix}$	A1
		(3)
(b)	$\mathbf{X} = \mathbf{BA}^{-1} = \begin{pmatrix} p & q \\ 6p & 11q \\ 5p & 8q \end{pmatrix}\frac{1}{pq}\begin{pmatrix} 5q & -3q \\ -3p & 2p \end{pmatrix} = \cdots$ Or $\mathbf{X} = \mathbf{BA}^{-1} = \begin{pmatrix} p & q \\ 6p & 11q \\ 5p & 8q \end{pmatrix}\begin{pmatrix} \frac{5}{p} & -\frac{3}{p} \\ -\frac{3}{q} & \frac{2}{q} \end{pmatrix} = \cdots$	M1
	$= \frac{1}{pq}\begin{pmatrix} 2pq & -pq \\ -3pq & 4pq \\ pq & pq \end{pmatrix}$ or equivalent e.g. $\begin{pmatrix} 5-3 & -3+2 \\ 30-33 & -18+22 \\ 25-24 & -15+16 \end{pmatrix}$ 4 correct elements from those above – simplified or unsimplified. The elements may not be in a matrix, or a matrix of the correct dimension.	A1
	$= \begin{pmatrix} 2 & -1 \\ -3 & 4 \\ 1 & 1 \end{pmatrix}$	dM1A1
		(4)
(b) Alternative		
	$\begin{pmatrix} a & b \\ c & d \\ e & f \end{pmatrix}\begin{pmatrix} 2p & 3q \\ 3p & 5q \end{pmatrix} = \begin{pmatrix} p & q \\ 6p & 11q \\ 5p & 8q \end{pmatrix}$ So $2a+3b=1$ *and* $3a+5b=1$; $a=2, b=-1$ or $2c+3d=6$ *and* $3c+5d=11$; $c=-3, d=4$ or $2e+3f=5$ *and* $3e+5f=8$; $e=1, f=1$	M1A1
	$a=2, b=-1 \quad c=-3, d=4 \quad e=1, f=1$	dM1
	$= \begin{pmatrix} 2 & -1 \\ -3 & 4 \\ 1 & 1 \end{pmatrix}$	A1

Notes

(a)

B1: Correct determinant. Simplified or unsimplified.

M1: Interchanges elements in major diagonal and changes signs in other diagonal.

A1: Completely correct answer in any form, simplified or unsimplified. If the matrix is correct and they then go on to simplify incorrectly then ISW

(b)

M1: Attempts $\mathbf{BA}^{-1}$ and finds at least one element using their inverse from (a). The matrix dimension may be incorrect or not shown but one correct element for their $\mathbf{BA}^{-1}$ after an attempt at $\mathbf{BA}^{-1}$ is sufficient. The element may be unsimplified.

A1: At least 4 elements correct. The elements may not yet be simplified.

dM1: Finds a 3×2 matrix of 6 elements.

A1: Correct simplified matrix.

Alternative:

M1: Attempts simultaneous equations from $\mathbf{XA = B}$ and solves for at least one constant.

A1: At least 4 correct values.

dM1: Finds all 6 elements for the 3×2 matrix.

A1: Correct simplified matrix.