

FP1 Matrices Answers

(ii)	$\mathbf{A}^2 = \begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$	M1A1	2	M1A0 for three correct entries
(b)(i)	$\mathbf{B}^2 = \begin{bmatrix} 1 & 2 \\ 0 & 1 \end{bmatrix}$	M1A1		M1A0 for three correct entries
	$\mathbf{B}^2 - \mathbf{A}^2 = \begin{bmatrix} 0 & 2 \\ 0 & 0 \end{bmatrix}$	A1✓	3	ft errors, dependent on both M marks
(ii)	$(\mathbf{B} + \mathbf{A})(\mathbf{B} - \mathbf{A}) = \begin{bmatrix} 1 & 0 \\ -1 & 1 \end{bmatrix} \begin{bmatrix} 1 & 2 \\ 1 & 1 \end{bmatrix}$	B1		
	$\dots = \begin{bmatrix} 1 & 2 \\ 0 & -1 \end{bmatrix}$	M1 A1✓	3	ft one error; M1A0 for three correct (ft) entries
5(a)(i)	$\mathbf{M}^2 = \begin{bmatrix} 0 & 1 \\ -1 & 0 \end{bmatrix}$	M1 A2,1	3	M1 if 2 entries correct M1A1 if 3 entries correct
(ii)	$\mathbf{M}^4 = \begin{bmatrix} -1 & 0 \\ 0 & -1 \end{bmatrix}$	B1✓	1	ft error in \mathbf{M}^2 provided no surds in \mathbf{M}^2
(c)	Awareness of $\mathbf{M}^8 = \mathbf{I}$ $\mathbf{M}^{2006} = \begin{bmatrix} 0 & -1 \\ 1 & 0 \end{bmatrix}$	M1 m1 A1✓	3	OE; NMS 2/3 complete valid method ft error in \mathbf{M}^2 as above
2(a)(i)	$\mathbf{A} + \mathbf{B} = \begin{bmatrix} \sqrt{3} & 0 \\ 1 & 0 \end{bmatrix}$	M1A1	2	M1A0 if 3 entries correct; Condone $\frac{2\sqrt{3}}{2}$ for $\sqrt{3}$
(ii)	$\mathbf{BA} = \begin{bmatrix} 1 & 0 \\ 0 & -1 \end{bmatrix}$	B3,2,1	3	Deduct one for each error; SC B2,1 for \mathbf{AB}
1(a)	$\mathbf{M} = \begin{bmatrix} 0 & -3 \\ -3 & 0 \end{bmatrix}$	B2,1	2	B1 if subtracted the wrong way round
(c)	$\mathbf{M}^2 = \begin{bmatrix} 9 & 0 \\ 0 & 9 \end{bmatrix}$ $\dots = 9\mathbf{I}$	B1F B1F	2	Or by geometrical reasoning; ft as before ft as before