Matrices 1 IGCSE Answers

1)

(a)	**CB** and **BA** cao	1, 1	Independent
(b)	$\begin{pmatrix} 8 & -24 \\ -4 & 16 \end{pmatrix}$ cao	3	**M1** $\frac{1}{2}\times\frac{1}{4}-\frac{3}{4}\times\frac{1}{8}\ (=\frac{1}{32})$ **M1** $\begin{pmatrix} \frac{1}{4} & -\frac{3}{4} \\ -\frac{1}{8} & \frac{1}{2} \end{pmatrix}$ seen
(c)	determinant is zero	1	Allow cannot divide by zero

2)

(a)	$\begin{pmatrix} 6x-3 \\ 4x+5 \end{pmatrix}$ but not $\begin{pmatrix} 6x & -3 \\ 4x & (+)5 \end{pmatrix}$	2	**B1** $6x-3$ or **B1** $4x+5$ in a (2×1) matrix on answer line
(b)	$(6x^2+x+5)$ cao	2	**M1** any 1×1 matrix in answer space

3)

(a)	$\begin{pmatrix} -5 & 7 \end{pmatrix}$	2	**B1** either correct in a (1×2) matrix
(b)	$\frac{1}{4}\begin{pmatrix} 2 & 1 \\ 2 & 3 \end{pmatrix}$ oe	2	**M1** for $\begin{pmatrix} 2 & 1 \\ 2 & 3 \end{pmatrix}$ seen or $2\times 3 - -1\times -2\ (=4)$
(c)	$\begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix}$ or I cao	1	

4)

(a)	**(i)** $\begin{pmatrix} 0 \end{pmatrix}$ brackets essential	**2**	**M1** $6\times 2+3\times -4$ or $12+-12$
	(ii) $\begin{pmatrix} 12 & 18 \\ -8 & -12 \end{pmatrix}$	**2**	**M1** any 2×2 matrix with 2 elements correct
(b)	$\frac{1}{2}\begin{pmatrix} 1 & -1 \\ -1 & 3 \end{pmatrix}$	**2**	**B1** $\frac{1}{2}\begin{pmatrix} a & c \\ b & d \end{pmatrix}$ seen or **B1** $k\begin{pmatrix} 1 & -1 \\ -1 & 3 \end{pmatrix}$ seen

5)

(a)	$\begin{pmatrix} -1 & 2 \\ 11 & 30 \end{pmatrix}$	**2**	**B1** any two entries correct
(b)	$\frac{1}{26}\begin{pmatrix} 4 & -2 \\ 3 & 5 \end{pmatrix}$ oe	**2**	**B1** $\frac{1}{26}\begin{pmatrix} a & b \\ c & d \end{pmatrix}$ or $k\begin{pmatrix} 4 & -2 \\ 3 & 5 \end{pmatrix}$

6)

(a)	$3\frac{1}{2}$	**2**	**M1** $2x-7=0$
(b)	3 and –3	**3**	**M1** $x^2-8=1$ **A1** $x=3$ **A1** $x=-3$
(c)	5	**2**	**M1** $x-2=3$

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7)

(a)	$(4 \quad 10)$	**2**	**B1** each element or correct without brackets
(b)	$\frac{1}{2}\begin{pmatrix} 3 & -4 \\ -1 & 2 \end{pmatrix}$ oe	**2**	**B1** for $\frac{1}{2}\begin{pmatrix} a & c \\ b & d \end{pmatrix}$ or $k\begin{pmatrix} 3 & -4 \\ -1 & 2 \end{pmatrix}$ seen

8)

(a)	$\begin{pmatrix} 8 & 0 \\ 0 & 8 \end{pmatrix}$ oe	2	**B1** for one column (or row) correct
(b)	$\begin{pmatrix} \frac{1}{4} & \frac{1}{4} \\ \frac{1}{4} & -\frac{1}{4} \end{pmatrix}$ oe	2	**B1** for $-1/8\begin{pmatrix} a & c \\ b & d \end{pmatrix}$ or **B1** for $\begin{pmatrix} -2 & -2 \\ -2 & 2 \end{pmatrix}$ seen