

AQA Qualifications

AQA Level 2 Certificate FURTHER MATHEMATICS

Level 2 (8360)

Worksheet 6 Matrices 2 Our specification is published on our website (<u>www.aqa.org.uk</u>). We will let centres know in writing about any changes to the specification. We will also publish changes on our website. The definitive version of our specification will always be the one on our website, this may differ from printed versions.

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Question 1

	$\mathbf{A} = \begin{pmatrix} 2 & -1 \\ 3 & 4 \end{pmatrix}$	B =	$= \begin{pmatrix} 7 & 4 \\ 5 & 3 \end{pmatrix}$	$\mathbf{C} = \begin{pmatrix} -2 & 3\\ 1 & -1 \end{pmatrix}$		
Work out						
(a) AB		(b)	BC	(c)	3 A	
(d) BA		(e)	- C	(f)	$\mathbf{B} \begin{pmatrix} 1 \\ -5 \end{pmatrix}$	-4 7)
						(12 marks)
Question	2					

Question 2

		$\mathbf{P} = \begin{pmatrix} -2 & 0\\ 5 & 1 \end{pmatrix}$	$\mathbf{Q} = \begin{pmatrix} -4 & 1 \\ 3 & -2 \end{pmatrix}$	$C = \begin{pmatrix} 3 \\ -2 \end{pmatrix}$		
Work	out					
(a)	P ²		(b) QP	(c	c) 5 Q	
(d)	PC		(e) IQ	(f) 3I	
						(12 marks)

Question 3

$$\begin{pmatrix} -2 & a \\ -4 & 3 \end{pmatrix} \begin{pmatrix} 3 \\ 7 \end{pmatrix} = \begin{pmatrix} 22 \\ 9 \end{pmatrix}$$

Work out the value of a.

Question 4

Work out the values of a, b and c.

$$\begin{pmatrix} 2 & a \\ 3 & 1 \end{pmatrix} \begin{pmatrix} 1 & 3 \\ 2 & b \end{pmatrix} = \begin{pmatrix} 12 & 26 \\ c & 13 \end{pmatrix}$$

(3 marks)

(2 marks)



Question 5

Work out the image of the point *D* (-1, 2) after transformation by the matrix $\begin{pmatrix} 2 & 3 \\ -1 & 1 \end{pmatrix}$

Question 6

The point A(m, n) is transformed to the point A' (-2, 0) by the matrix $\begin{pmatrix} 2 & 3 \\ 1 & 1 \end{pmatrix}$ Work out the values of *m* and *n*.

Question 7

The matrix A represents a reflection in the line y = x. Write down the matrix A.

The unit square is transformed by the matrix *A* and then by rotation through -90° about *O*. Work out the matrix representing the combined transformation.

(4 marks)

(2 marks)

(4 marks)

Question 8

Describe fully the transformation given by the matrix $\begin{pmatrix} 0 & -1 \\ -1 & 0 \end{pmatrix}$

(2 marks)

Question 9 (non-calculator)

The unit square *OABC* is transformed by the matrix $\begin{pmatrix} h & 0 \\ 0 & h \end{pmatrix}$ to the square *OA'B'C'*.

The area of OA'B'C' is 27.

Work out the exact value of h.

(3 marks)

Question 10

$$\mathbf{A} = \begin{pmatrix} 3 & 0 \\ 0 & 3 \end{pmatrix} \text{ and } \mathbf{B} = \begin{pmatrix} -1 & 0 \\ 0 & 1 \end{pmatrix}$$

The point *P* (2, 7) is transformed by matrix **BA** to **P**'. Show that *P* lies on the line 7x + 2y = 0

(3 marks)