1st Class Maths

Matrix Multiplication

Revise this topic →

← Check your work

This booklet features original exam style questions designed by me. They do not feature in past papers but are good practice for your exams.

The content is designed to reflect the style of the AQA Level 2 Certificate in Further Maths.
It may not be suitable for other courses.

@1stclassmaths

Answer **all** questions in the spaces provided.

Do not write outside the box

1 Work out $6\begin{pmatrix} -2 \\ 5 \end{pmatrix}$ **[1 mark]**

Answer _____

2 Work out $-4\begin{pmatrix} 8 \\ -1 \end{pmatrix}$ **[1 mark]**

Answer _____

3 Work out $3\begin{pmatrix} 5 & 1 \\ 2 & 0 \end{pmatrix}$ **[1 mark]**

Answer _____

4 Work out $-4\begin{pmatrix} 6 & -2 \\ -2 & 4 \end{pmatrix}$ **[1 mark]**

Answer _____

Do not write outside the box

5 Work out $\begin{pmatrix} 4 & 0 \\ 2 & 1 \end{pmatrix}\begin{pmatrix} 1 \\ 5 \end{pmatrix}$ **[1 mark]**

Answer _____

6 Work out $\begin{pmatrix} -3 & 1 \\ 6 & -2 \end{pmatrix}\begin{pmatrix} 2 \\ -1 \end{pmatrix}$ **[1 mark]**

Answer _____

7 Work out $\begin{pmatrix} 2 & 3 \\ 0 & 5 \end{pmatrix}\begin{pmatrix} 1 & 0 \\ 4 & 2 \end{pmatrix}$ **[2 marks]**

Answer _____

8

Do not write outside the box

8 Work out $\begin{pmatrix} 2 & -4 \\ 0 & 3 \end{pmatrix}\begin{pmatrix} 1 & -1 \\ 4 & -3 \end{pmatrix}$ **[2 marks]**

Answer _____

9 Work out $\begin{pmatrix} 3 & 5 \\ 4 & 0 \end{pmatrix}\begin{pmatrix} 1 & -1 \\ 2 & 2 \end{pmatrix}\begin{pmatrix} 3 \\ -2 \end{pmatrix}$ **[3 marks]**

Answer _____

Do not write outside the box

10 Work out $5\begin{pmatrix} -2 & 4 \\ -3 & 0 \end{pmatrix}\begin{pmatrix} 1 \\ 5 \end{pmatrix}$ **[2 marks]**

Answer _____

11 Work out $3\begin{pmatrix} 0 & 3 \\ -1 & 0 \end{pmatrix}\begin{pmatrix} 6 & 1 \\ -2 & -1 \end{pmatrix}$ **[3 marks]**

Answer _____

10

Do not write outside the box

12 $\mathbf{A} = \begin{pmatrix} 5 & 2 \\ 3 & -3 \end{pmatrix}$ $\mathbf{B} = \begin{pmatrix} -1 \\ 0 \end{pmatrix}$ $\mathbf{C} = \begin{pmatrix} 0 & 1 \\ 3 & 2 \end{pmatrix}$

12 (a) Work out **AB**

[1 mark]

Answer _____

12 (b) Work out 2**AC**

[3 marks]

Answer _____

12 (c) Work out $\mathbf{C}^2$

[2 marks]

Answer _____

Do not write outside the box

12 (d) By finding **AC** and **CA,** show that matrix multiplication is not commutative.

[5 marks]

11

Turn over ►

Do not write outside the box

13 Work out $\begin{pmatrix} \sqrt{3} & 1 \\ 1 & \sqrt{2} \end{pmatrix}\begin{pmatrix} 2 & \sqrt{3} \\ 0 & 1 \end{pmatrix}$ **[2 marks]**

Answer _____

14 Work out $\begin{pmatrix} a & 4 \\ a^2 & a \end{pmatrix}\begin{pmatrix} 2 & 4a^2 \\ a & -a^3 \end{pmatrix}$

Fully simplify your answer. **[4 marks]**

Answer _____

Do not write outside the box

15 $a\begin{pmatrix} 4 & 1 \\ 0 & -2 \end{pmatrix}\begin{pmatrix} b \\ -3 \end{pmatrix} = \begin{pmatrix} -9 \\ 9 \end{pmatrix}$

Work out the values of a and b.

[5 marks]

$a =$ _____ $b =$ _____

16 $\begin{pmatrix} 0 & c \\ d & d \end{pmatrix}\begin{pmatrix} d \\ 3 \end{pmatrix} = \begin{pmatrix} -12 \\ 10 \end{pmatrix}$

Work out the values of c and d.

[4 marks]

$c =$ _____ $d =$ _____ and $d =$ _____

15

Do not write outside the box

17 $\mathbf{A} = \begin{pmatrix} 3 & 4 \\ 3 & 1 \end{pmatrix}$ $\mathbf{B} = \begin{pmatrix} 1 & x \\ 3 & 1 \end{pmatrix}$ $\mathbf{C} = \begin{pmatrix} 4 & 2 \\ 2 & 0 \end{pmatrix}$

$\mathbf{AB} = k\mathbf{C}^2$

Work out the values of k and x.

[5 marks]

$k =$ _____ $x =$ _____

Do not write outside the box

18 $\begin{pmatrix} 2 & b \\ a & 3b \end{pmatrix}\begin{pmatrix} a \\ 1 \end{pmatrix} = \begin{pmatrix} 8 \\ 19 \end{pmatrix}$

Work out two pairs of values of a and b.

[5 marks]

$a =$ _____ $b =$ _____

$a =$ _____ $b =$ _____

10