Name:

Level 2 Further Maths

Matrices

Corbettmaths

Ensure you have: Pencil or pen

Guidance

1. Read each question carefully before you begin answering it.
2. Check your answers seem right.
3. Always show your workings

Revision for this topic

www.corbettmaths.com/more/further-maths/

1. $\mathbf{A} = \begin{pmatrix} 4 & -1 \\ 0 & 7 \end{pmatrix}$

Work out the matrix 3**A**

.....

(1)

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2. $\mathbf{B} = \begin{pmatrix} -3 & 9 \\ 8 & -1 \end{pmatrix}$

Work out the matrix 8**B**

.....

(1)

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3. The 2 x 2 matrix **I** is the identity matrix.

Write down the 2 x 2 matrix **I**

I = ...

(1)

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

Work out the matrix **AB**

.....

(2)

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5. $\mathbf{C} = \begin{pmatrix} -3 & 5 \\ -2 & -8 \end{pmatrix}$ $\mathbf{D} = \begin{pmatrix} 9 \\ -4 \end{pmatrix}$

Work out the matrix **CD**

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(2)

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6. $\mathbf{E} = \begin{pmatrix} 1 \\ -5 \end{pmatrix}$ $\mathbf{F} = \begin{pmatrix} 0 & 6 \\ -3 & -9 \end{pmatrix}$

Work out the matrix **FE**

.....

(2)

7. $\mathbf{A} = \begin{pmatrix} 4 & 1 \\ 0 & 2 \end{pmatrix}$ $\mathbf{B} = \begin{pmatrix} 3 & 1 \\ 2 & 0 \end{pmatrix}$

Work out the matrix **AB**

.....

(3)

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8. $\mathbf{C} = \begin{pmatrix} 4 & -2 \\ -1 & 5 \end{pmatrix}$ $\mathbf{D} = \begin{pmatrix} -7 & 0 \\ 2 & 6 \end{pmatrix}$

Work out the matrix **CD**

.....

(3)

9. $\mathbf{A} = \begin{pmatrix} 0 & 3 \\ 2 & 1 \end{pmatrix}$ $\mathbf{B} = \begin{pmatrix} 4 & -1 \\ -1 & 3 \end{pmatrix}$

Work out the matrix **BA**

.....

(3)

10. $\mathbf{M} = \begin{pmatrix} -3 & 1 \\ -2 & -4 \end{pmatrix}$

Work out the matrix $\mathbf{M}^2$

.....

(3)

11. $3\begin{pmatrix} a \\ 4-2a \end{pmatrix} = \begin{pmatrix} 15 \\ b \end{pmatrix}$

Work out the values of *a* and *b*

a = ...

b = ...

(3)

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12. $4\begin{pmatrix} 6-c \\ d \end{pmatrix} = c\begin{pmatrix} -2 \\ 9 \end{pmatrix}$

Work out the values of *c* and *d*

c = ...

d = ...

(3)

13. $\mathbf{A} = \begin{pmatrix} 6 & -2 \\ 1 & -1 \end{pmatrix}$ $\mathbf{B} = \begin{pmatrix} 4 \\ 3 \end{pmatrix}$

(a) Work out the matrix $\mathbf{A}^2$

.....

(3)

(b) Give a reason why it is not possible to work out $\mathbf{B}^2$

.....

.....

(1)

(c) $k\,\mathbf{B} = \begin{pmatrix} 2k + 15 \\ k + 15 \end{pmatrix}$ where k is a constant.

Work out the value of k

.....

(2)

14. $\mathbf{A} = \begin{pmatrix} 3 & 9 \\ -2 & 8 \end{pmatrix}$ $\mathbf{B} = \begin{pmatrix} p \\ -1 \end{pmatrix}$ $\mathbf{C} = \begin{pmatrix} 9 \\ q \end{pmatrix}$

p and *q* are constants.

Given **AB = C**

Work out the values of *p* and *q*

p = ...

q = ...

(3)

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15. $\begin{pmatrix} 2 & -1 \\ 0 & 1 \end{pmatrix} \begin{pmatrix} a & b \\ 0 & c \end{pmatrix} = \mathbf{I}$ where $\mathbf{I}$ is the identity matrix

Work out the values of *a, b* and *c*

a = ...

b = ...

c = ...

(3)

16. $\begin{pmatrix} -6 & 2 \\ 5 & -4 \end{pmatrix} \begin{pmatrix} -4 & -2 \\ -5 & m \end{pmatrix} = 14\,\mathbf{I}$

Work out the value of m

a = ...

b = ...

c = ...

(3)

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17. Given that $\begin{pmatrix} 5 & 1 \\ -3 & 2 \end{pmatrix} \begin{pmatrix} c \\ d \end{pmatrix} = \begin{pmatrix} d+6 \\ -4c-4d \end{pmatrix}$

Work out the values of *c* and *d*

c = ...

d = ...

(4)

18. Given that $\begin{pmatrix} -2 & 3 \\ 4 & 1 \end{pmatrix} \begin{pmatrix} a \\ b \end{pmatrix} = \begin{pmatrix} b-8 \\ a+2 \end{pmatrix}$

Work out the values of *a* and *b*

a = ...

b = ...

(5)

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18. $\mathbf{A} = \begin{pmatrix} 1 & 0 \\ 1 & 1 \end{pmatrix}$ $\mathbf{B} = \begin{pmatrix} p & q \\ 4 & 3 \end{pmatrix}$

AB = BA

Work out the values of *p* and *q*

p = ...

q = ...

(5)

19. $\begin{pmatrix} 3 & -1 \\ 2 & 3 \end{pmatrix} \begin{pmatrix} x \\ y \end{pmatrix} = \begin{pmatrix} 23 \\ 8 \end{pmatrix}$

Work out the values of x and *y*

x = ...

y = ...

(4)

20. $\begin{pmatrix} 2 & y \\ x & -12 \end{pmatrix} \begin{pmatrix} x \\ 2 \end{pmatrix} = \begin{pmatrix} 7 \\ 5x \end{pmatrix}$

Work out the possible values for x and y

.....

(5)

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21. $\begin{pmatrix} 1 & 2 \\ x & 3x \end{pmatrix} \begin{pmatrix} x \\ y \end{pmatrix} = \begin{pmatrix} 3 \\ 10 \end{pmatrix}$

Work out the possible values for x and y

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(6)