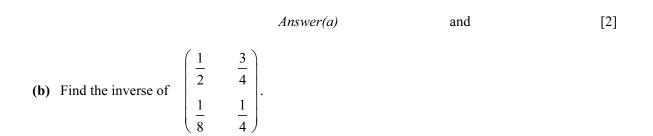
## Matrices 1 IGCSE

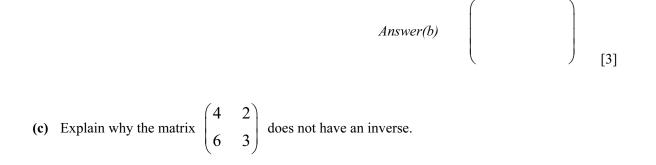
(a) A is a  $(2 \times 4)$  matrix, B is a  $(3 \times 2)$  matrix and C is a  $(1 \times 3)$  matrix.

Which two of the following matrix products is it possible to work out?

$\mathbf{A}^2$	$\mathbf{B}^2$	$\mathbf{C}^2$	AB	AC	BA	BC	CA	СВ



Simplify your answer as far as possible.



Answer(c)

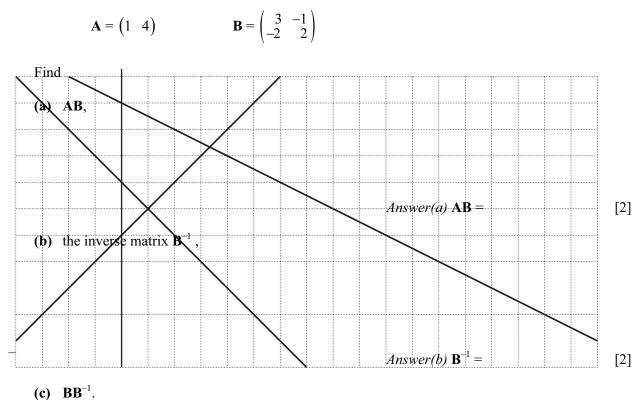
1)

$$\mathbf{M} = \begin{pmatrix} 6 & -3 \\ 4 & 5 \end{pmatrix} \begin{pmatrix} x \\ 1 \end{pmatrix}.$$

(a) Find the matrix M.

$$Answer(a) \mathbf{M} = [2]$$

(b) Simplify (x = 1) M.



Answer(b)



Answer(c)  $\mathbf{BB}^{-1} =$ [1]

2)

3)

[2]

4)

(a)

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

	Answer(a)(i)	[2]
Work out <b>BA</b> .		

Answer(a)(ii)

[2]

 $(b) \quad \mathbf{C} = \begin{pmatrix} 3 & 1 \\ 1 & 1 \end{pmatrix}$ 

(ii)

Find  $\mathbf{C}^{-1}$ , the inverse of  $\mathbf{C}$ .

Answer(b)

[2]

$$\mathbf{M} = \begin{pmatrix} 5 & 2 \\ -3 & 4 \end{pmatrix} \qquad \qquad \mathbf{N} = \begin{pmatrix} -1 & -2 \\ 2 & 6 \end{pmatrix}$$

Calculate

(a) MN,

 $Answer(a) \mathbf{MN} = [2]$ 

(b)  $\mathbf{M}^{-1}$ , the inverse of  $\mathbf{M}$ .

 $Answer(b) \mathbf{M}^{-1} = [2]$ 

5)

## Find the values of *x* for which

(a) 
$$\begin{pmatrix} 1 & 0 \\ 0 & 2x-7 \end{pmatrix}$$
 has no inverse,

Answer(a) x = [2]

**(b)** 
$$\begin{pmatrix} 1 & 0 \\ 0 & x^2 - 8 \end{pmatrix}$$
 is the identity matrix,

Answer (b) 
$$x =$$
 or  $x =$  [3]

(c) 
$$\begin{pmatrix} 1 & 0 \\ 0 & x - 2 \end{pmatrix}$$
 represents a stretch with factor 3 and the x axis invariant.

Answer (c) 
$$x =$$
 [2]

 $\mathbf{A} = \begin{pmatrix} 2 & 2 \\ 2 & -2 \end{pmatrix}$ 

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

(a) Calculate BA.

Answer(a) [2]

(b) Find  $\mathbf{A}^{-1}$ , the inverse of  $\mathbf{A}$ .

Answer(b) [2]

8)

Work out

(a)  $A^2$ ,



(b)  $A^{-1}$ , the inverse of A.