Dr Oliver Mathematics
Further Mathematics
$n \times m$ Matrices
Past Examination Questions

This booklet consists of 3 questions across a variety of examination topics.
The total number of marks available is 8.

1. Given that (2)

$$\mathbf{A} = \begin{pmatrix} 3 & 1 & 3 \\ 4 & 5 & 5 \end{pmatrix} \text{ and } \mathbf{B} = \begin{pmatrix} 1 & 1 \\ 1 & 2 \\ 0 & -1 \end{pmatrix},$$

   find $\mathbf{AB}$.

2. Given that (2)

$$\mathbf{C} = \begin{pmatrix} 2 \\ -3 \\ 4 \end{pmatrix}, \mathbf{D} = \begin{pmatrix} 2 & -1 & 5 \end{pmatrix}, \text{ and } \mathbf{E} = \mathbf{CD},$$

   find $\mathbf{E}$.

3. Given that

$$\mathbf{A} = \begin{pmatrix} 1 & 2 \\ 3 & -1 \\ 4 & 5 \end{pmatrix} \text{ and } \mathbf{B} = \begin{pmatrix} 2 & -1 & 4 \\ 1 & 3 & 1 \end{pmatrix},$$

   (a) find $\mathbf{AB}$. (3)
   (b) Explain why $\mathbf{AB} \neq \mathbf{BA}$. (1)