

Exercise walk-through

Matrices ■ 4.10

eXercise

You must be able to

- state the **dimensions** 维数 of a **matrix** 矩阵
- add matrices and multiply a matrix by a scalar

Method — Matrices

A matrix is a rectangular array of numbers with dimensions rows $\times$ columns. Add matrices of the **same size** entrywise; multiply by a scalar entrywise.

Method — Example

$\begin{bmatrix} 1 & 2 \\ 3 & 4 \end{bmatrix}$ is 2×2 . Adding $\begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$ gives $\begin{bmatrix} 2 & 2 \\ 3 & 5 \end{bmatrix}$.

Practice 2.1 ■ 1 mark

State the dimensions of a matrix with 2 rows and 3 columns.

Solution 2.1

Method: Matrices

Worked steps

2×3 **B1**.

Practice 2.2 ■ 1 mark

State when two matrices can be added.

Solution 2.2

Worked steps

when they have the same dimensions **B1**.

Practice 2.3 ■ 2 marks

Add $\begin{bmatrix} 1 & 2 \\ 3 & 4 \end{bmatrix} + \begin{bmatrix} 0 & 1 \\ 1 & 0 \end{bmatrix}$.

Solution 2.3

Method: Example

Worked steps

$$\begin{bmatrix} 1 & 3 \\ 4 & 4 \end{bmatrix} \quad \text{M1 A1}.$$

Exam-style 3.1 ■ 1 mark

A matrix with 3 rows and 2 columns is

A 2×3

B 3×2

C 6×1

D 2×2

Solution 3.1

Method: Matrices

A 2×3

B 3×2 

C 6×1

D 2×2

Worked steps

B.

Exam-style 3.2 ■ 1 mark

Two matrices can be added only if they

- A** are square
- B** have the same dimensions
- C** are diagonal
- D** have determinant 0

Solution 3.2

- A are square
- B have the same dimensions 
- C are diagonal
- D have determinant 0

Worked steps

B.

Exam-style 3.3 ■ 1 mark

$$A = \begin{bmatrix} 2 & 0 \\ 1 & 3 \end{bmatrix}.$$

(a) State the dimensions.

(b) Find $2A$.

(c) Find $A + \begin{bmatrix} 1 & 1 \\ 1 & 1 \end{bmatrix}$.

Solution 3.3

Method: Example

Worked steps

(a) 2×2 **B1**. (b) $\begin{bmatrix} 4 & 0 \\ 2 & 6 \end{bmatrix}$ **B1**. (c) $\begin{bmatrix} 3 & 1 \\ 2 & 4 \end{bmatrix}$ **B1**.