

Matric Arithmetic – Section Test

(Answers)

$$\begin{aligned} 1) \quad PQ &= \begin{pmatrix} -1 & 2 \\ 1 & 3 \end{pmatrix} \begin{pmatrix} -2 & 4 \\ -3 & 5 \end{pmatrix} \\ &= \begin{pmatrix} -1 \times -2 + 2 \times -3 & -1 \times 4 + 2 \times 5 \\ 1 \times -2 + 3 \times -3 & 1 \times 4 + 3 \times 5 \end{pmatrix} \\ &= \begin{pmatrix} -4 & 6 \\ -11 & 19 \end{pmatrix} \end{aligned}$$

The value of w is -4

2)

From the working in question 1, the value of x is 6.

3)

From the working in question 1, the value of y is -11.

4)

From the working in question 1, the value of z is 19.

5)

$$\begin{aligned} 2A &= 2 \begin{pmatrix} 2 & 3 \\ 1 & 4 \end{pmatrix} \\ &= \begin{pmatrix} 4 & 6 \\ 2 & 8 \end{pmatrix} \end{aligned}$$

6)

$$\begin{aligned} BA &= \begin{pmatrix} 3 & -1 \\ 0 & 2 \end{pmatrix} \begin{pmatrix} 2 & 3 \\ 1 & 4 \end{pmatrix} \\ &= \begin{pmatrix} (3 \times 2) + (-1 \times 1) & (3 \times 3) + (-1 \times 4) \\ (0 \times 2) + (2 \times 1) & (0 \times 3) + (2 \times 4) \end{pmatrix} = \begin{pmatrix} 5 & 5 \\ 2 & 8 \end{pmatrix} \end{aligned}$$

7)

$$\begin{aligned} AC &= \begin{pmatrix} 2 & 3 \\ 1 & 4 \end{pmatrix} \begin{pmatrix} -1 \\ 2 \end{pmatrix} \\ &= \begin{pmatrix} (2 \times -1) + (3 \times 2) \\ (1 \times -1) + (4 \times 2) \end{pmatrix} \\ &= \begin{pmatrix} 4 \\ 7 \end{pmatrix} \end{aligned}$$

8)

$$\begin{aligned} BC &= \begin{pmatrix} 3 & -1 \\ 0 & 2 \end{pmatrix} \begin{pmatrix} -1 \\ 2 \end{pmatrix} \\ &= \begin{pmatrix} (3 \times -1) + (-1 \times 2) \\ (0 \times -1) + (2 \times 2) \end{pmatrix} \\ &= \begin{pmatrix} -5 \\ 4 \end{pmatrix} \end{aligned}$$

9)

$$\begin{aligned} A^2 &= \begin{pmatrix} 2 & 3 \\ 1 & 4 \end{pmatrix} \begin{pmatrix} 2 & 3 \\ 1 & 4 \end{pmatrix} \\ &= \begin{pmatrix} (2 \times 2) + (3 \times 1) & (2 \times 3) + (3 \times 4) \\ (1 \times 2) + (4 \times 1) & (1 \times 3) + (4 \times 4) \end{pmatrix} \\ &= \begin{pmatrix} 7 & 18 \\ 6 & 19 \end{pmatrix} \end{aligned}$$

10)

I is the matrix $\begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix}$, so (i) is true but (ii) is not.