The information given can be represented by the matrices **A** and **B** as shown below.

$$A = \begin{pmatrix} 8 & 5 & 6 & 4 \\ 5 & 9 & 3 & 8 \end{pmatrix} \text{ and } B = \begin{pmatrix} 4 \\ 5 \\ 2 \\ 3 \end{pmatrix}.$$

(a) What does the sum of the elements in each row of **A** represent?

(b) (i) Find **AB**.

  (ii) What do the elements in **AB** represent?

(c) The scale factors of the aspects were changed to 7, 5, 6 and 2 respectively.

  (i) Recalculate **AB**.

  (ii) Would the change in the scale factors of the aspects affect the selection between these two applicants?

18. Shan and Rohanna are two salespersons for the fitness programmes of a gymnasium. The new subscriptions that they obtained in May and June are shown in the following tables.

	Shan	Rohanna
Package A	17	15
Package B	32	36
Package C	11	13

May

	Shan	Rohanna
Package A	20	19
Package B	28	31
Package C	15	12

June

It is given that $M = \begin{pmatrix} 17 & 15 \\ 32 & 36 \\ 11 & 13 \end{pmatrix}$ and $J = \begin{pmatrix} 20 & 19 \\ 28 & 31 \\ 15 & 12 \end{pmatrix}$.

(a) (i) Evaluate **J − M**.

  (ii) Explain what the elements in **J − M** represent.

(b) The sales commissions for packages *A*, *B* and *C* are $20, $35 and $50 respectively. Write down a matrix **C** such that the product **CM** will show the total amount of commissions for each salesperson in May.

(c) It is given that $X = \begin{pmatrix} 1 \\ 1 \end{pmatrix}$.

  (i) Evaluate **JX**.

  (ii) What do the numbers in **JX** represent?

(d) The prices of packages *A*, *B* and *C* are $400, $600 and $900 respectively.

  (i) Write down a matrix **P** such that **PJX** will give the total amount of sales from the new subscriptions obtained by Shan and Rohanna in June.

  (ii) What was the total amount of sales obtained by Shan and Rohanna in June?