

Weaknesses

- ◆ Candidates were unable to find the correct inverse due to wrong computation of the determinant.
- ◆ Very few candidates were able to form simultaneous equations using the given letters.
- ◆ Some candidates were completely unable to use an inverse to solve the equations.
- ◆ Many candidates could not find percentage discount using the given information.

Expected Responses

In part (a), candidates were to find the inverse of matrix A, A^{-1}

$$A^{-1} = \begin{pmatrix} -4 & 3 \\ 3 & -2 \end{pmatrix}$$

In part (b), which proved the most difficult part of the question, candidates needed to form the two equations as:

$$\begin{array}{l} \text{and} \quad 200x + 300y = 850,000 \\ \quad \quad 90x + 120y = 360,000 \end{array}$$

The candidates were then required to use the inverse of A above to solve the two equations simultaneously as displayed below:-

Reducing the two equation into their simplest forms, would reduce them into:

$$\begin{array}{l} 2x + 3y = 8,500 \\ 3x + 4y = 12,000 \end{array}$$

These two equations can then be written in matrix form as:

$$\begin{pmatrix} 2 & 3 \\ 3 & 4 \end{pmatrix} \begin{pmatrix} x \\ y \end{pmatrix} = \begin{pmatrix} 8500 \\ 12000 \end{pmatrix}$$

Using the matrix identify: $A^{-1} A = I$

$$\begin{pmatrix} -4 & 3 \\ 3 & -2 \end{pmatrix} \begin{pmatrix} 2 & 3 \\ 3 & 4 \end{pmatrix} \begin{pmatrix} x \\ y \end{pmatrix} = \begin{pmatrix} -4 & 3 \\ 3 & -2 \end{pmatrix} \begin{pmatrix} 8500 \\ 12000 \end{pmatrix}$$

$$\begin{array}{lcl} x & = & 2,000 \\ y & = & 1,500 \end{array}$$