23. A company held a dinner party. The number of guests by races and genders at 7 p.m. is represented by the matrix.

$$D = \begin{pmatrix} 25 & 12 \\ 8 & 3 \\ 17 & 5 \end{pmatrix} \begin{matrix} \text{Chinese} \\ \text{Indian} \\ \text{Malay} \end{matrix}$$

with columns labelled Male, Female.

The guests that arrived and those that left between 7 p.m. and 8 p.m. are represented by the matrices

$$A = \begin{pmatrix} 4 & 3 \\ 1 & 0 \\ 0 & 2 \end{pmatrix} \begin{matrix} \text{Chinese} \\ \text{Indian} \\ \text{Malay} \end{matrix} \quad \text{and} \quad L = \begin{pmatrix} 1 & 2 \\ 0 & 0 \\ 1 & 1 \end{pmatrix} \begin{matrix} \text{Chinese} \\ \text{Indian} \\ \text{Malay} \end{matrix}$$

with columns labelled Male, Female, respectively.

(a) (i) Compute F if $F = D + (A - L)$.
    (ii) What does F represent?
    (iii) The elements in the second row and the second column of D and F are equal. What does this mean?

(b) A lucky draw was conducted only for guests who were present in the matrix F. The names drawn out were not replaced in the lucky bowl. Find the probability that
    (i) a Malay guest is selected in the first draw,
    (ii) a female Malay guest is selected in the second draw given that the first drawn is a Chinese.

24. A car dealer records the numbers of cars sold in the first quarter of some models and their unit selling prices in the following table.

Model	Jan	Feb	March	Unit selling price (thousand dollars)
XP-3	8	7	10	80
GLI-250	10	12	15	65
MPD-100	1	0	1	300
OPA-5	2	1	3	200

(a) (i) Which model is the most popular with customers?
    (ii) Give a possible reason for your answer in (i).

(b) Represent the number of each model of cars sold in the three months by a 4×3 matrix G.

(c) Each element in the product MG gives the total number of cars that were sold in each month.
    (i) Formulate and write down the matrix M.
    (ii) Compute MG.

(d) Each element in the product GD gives the total number of each model of cars that were sold during the 3-month period.
    (i) Formulate and write down the matrix D.
    (ii) Compute GD.

(e) The product SGD gives the total sales figure, in thousand dollars, of the car dealer during the 3-month period.
    (i) Formulate and write down the matrix S.
    (ii) Compute SGD.