Step-1

Suppose M is the matrix whose row sum = 15, column sum = 15 and diagonal sum = 15 for any row or column or diagonal.

For initiation, we are given with the first row 8, 3, 4.

So, we get $$M = \begin{pmatrix} 8 & 3 & 4 \\ 1 & 5 & 9 \\ 6 & 7 & 2 \end{pmatrix}$$

Step-2

M timeâ€™s column $\begin{pmatrix} 1 & 1 & 1 \end{pmatrix}$ is

$$\begin{pmatrix} 8 & 3 & 4 \\ 1 & 5 & 9 \\ 6 & 7 & 2 \end{pmatrix}\begin{pmatrix} 1 \\ 1 \\ 1 \end{pmatrix} = \begin{pmatrix} 8+3+4 \\ 1+5+9 \\ 6+7+2 \end{pmatrix} = \begin{pmatrix} 15 \\ 15 \\ 15 \end{pmatrix}$$

Step-3

Row vector $\begin{pmatrix} 1 & 1 & 1 \end{pmatrix}$ times M is

$$\begin{pmatrix} 1 & 1 & 1 \end{pmatrix}\begin{pmatrix} 8 & 3 & 4 \\ 1 & 5 & 9 \\ 6 & 7 & 2 \end{pmatrix} = \begin{pmatrix} 8+1+6 & 3+5+7 & 4+9+2 \end{pmatrix}$$
$$= \begin{pmatrix} 15 & 15 & 15 \end{pmatrix}$$