A6(a)

We are given the matrix

$$A = \begin{bmatrix} 0 & 2 & 4 \\ 2 & 4 & 2 \\ 3 & 3 & 1 \end{bmatrix} \quad \text{and the vector} \quad \mathbf{c} = \begin{bmatrix} 1 \\ 1 \\ 1 \end{bmatrix}.$$

We want to compute $A\mathbf{c}$.

$$A\mathbf{c} = \begin{bmatrix} 0 & 2 & 4 \\ 2 & 4 & 2 \\ 3 & 3 & 1 \end{bmatrix} \begin{bmatrix} 1 \\ 1 \\ 1 \end{bmatrix} = \begin{bmatrix} (0 \cdot 1) + (2 \cdot 1) + (4 \cdot 1) \\ (2 \cdot 1) + (4 \cdot 1) + (2 \cdot 1) \\ (3 \cdot 1) + (3 \cdot 1) + (1 \cdot 1) \end{bmatrix}.$$

$$= \begin{bmatrix} 0 + 2 + 4 \\ 2 + 4 + 2 \\ 3 + 3 + 1 \end{bmatrix} = \begin{bmatrix} 6 \\ 8 \\ 7 \end{bmatrix}.$$

Thus,

$$A\mathbf{c} = \begin{bmatrix} 6 \\ 8 \\ 7 \end{bmatrix}.$$