$$2A = \begin{bmatrix} 0 & 2 & 2 \\ 2 & 0 & 2 \\ 2 & 2 & 0 \end{bmatrix}$$

$$-3I_3 = \begin{bmatrix} -3 & 0 & 0 \\ 0 & -3 & 0 \\ 0 & 0 & -3 \end{bmatrix}$$

$$\implies \qquad A^2 - 2A - 3I_3 = \begin{bmatrix} -1 & 3 & 3 \\ 3 & -1 & 3 \\ 3 & 3 & -1 \end{bmatrix}$$

Remark. Note that multiplication of a matrix by a scalar and that of a determinant by a scalar are defined differently: a matrix is multiplied by a scalar by multiplying every element by multiplying only one row(column) by that scalar.

Thus

$$c \begin{bmatrix} 8 & 1 & 6 \\ 3 & 5 & 7 \\ 4 & 9 & 2 \end{bmatrix} = \begin{bmatrix} 8c & c & 6c \\ 3c & 5c & 7c \\ 4c & 9c & 2c \end{bmatrix},$$

$$c \begin{vmatrix} 8 & 1 & 6 \\ 3 & 5 & 7 \\ 4 & 9 & 2 \end{vmatrix} = \begin{vmatrix} 8c & c & 6c \\ 3 & 5 & 7 \\ 4 & 9 & 2 \end{vmatrix} = \begin{vmatrix} 8 & c & 6 \\ 3 & 5c & 7 \\ 4 & 9c & 2 \end{vmatrix}$$

As a result we have for a matrix A of order n,

$$det\ c[a_ij] = det\ [ca_ij] = c^n\ det[a_ij]$$