

Soluții

1. a) $A^2 = \begin{pmatrix} 0 & 0 \\ 0 & 0 \end{pmatrix}.$

b) $M(1,1) = \begin{pmatrix} 3 & -1 \\ 4 & -1 \end{pmatrix}, \det(M(1,1)) = 1, (M(1,1))^{-1} = \begin{pmatrix} -1 & 1 \\ -4 & 3 \end{pmatrix}.$

c) $M(x,y) = \begin{pmatrix} x+2y & -y \\ 4y & x-2y \end{pmatrix}, \det(M) = x^2 \Rightarrow x \in \mathbb{R}^*.$

2. a) $f(-p) = 1.$

b) $f(1) = 0 \Leftrightarrow 2 + p = 0 \Leftrightarrow p = -2.$

c) $x_1 + x_2 + x_3 = -p, x_1x_2 + x_1x_3 + x_3x_2 = 0 \Rightarrow x_1^2 + x_2^2 + x_3^2 = p^2, x_1x_2x_3 = -1.$
 $\Rightarrow x_1^2x_2^2 + x_1^2x_3^2 + x_2^2x_3^2 = 0 - 2 \cdot (-1) \cdot (-p) = -2p \Rightarrow x_1^4 + x_2^4 + x_3^4 = p^4 + 4p.$