

BLOQUE ÁLGEBRA

1A

a)

$$A = \begin{pmatrix} m & \sqrt{m} & \sqrt{m} \\ \sqrt{m} & m & 1 \\ \sqrt{m} & 1 & m \end{pmatrix}$$

$$|A| = (m^3 + \sqrt{m}^2 + \sqrt{m}^2) - (m \cdot \sqrt{m}^2 + m + m \cdot \sqrt{m}^2) = m^3 + m + m - m^2 - m - m^2 = m^3 - 2m^2 + m$$

$$m^3 - 2m^2 + m = 0$$

$$m(m^2 - 2m + 1) = 0$$

$$m = 0$$

$$m^2 - 2m + 1 = 0$$

$$m = \frac{-(-2) \pm \sqrt{(-2)^2 - 4 \cdot 1 \cdot 1}}{2 \cdot 1} = \frac{2 \pm \sqrt{0}}{2} = 1$$

LA MATRIZ A TIENE INVERSA CUANDO SU DETERMINANTE NO SE ANULA, ES DECIR, CUANDO $m \neq 0$ y $m \neq 1$.

⑥

$$A = \begin{pmatrix} 4 & 2 & 2 \\ 2 & 4 & 1 \\ 2 & 1 & 4 \end{pmatrix}$$

$$AX = 12I$$

$$X = A^{-1} 12I$$

$$12I = \begin{pmatrix} 12 & 0 & 0 \\ 0 & 12 & 0 \\ 0 & 0 & 12 \end{pmatrix}$$

$$A^{-1} = \frac{(A^t)^{\text{Adj.}}}{|A|} = \frac{\begin{pmatrix} 4 & 2 & 2 \\ 2 & 4 & 1 \\ 2 & 1 & 4 \end{pmatrix}^{\text{Adj.}}}{(64+4+4)-(16+16+4)} =$$

$$= \frac{\begin{pmatrix} |4 & 1| & -|2 & 1| & |2 & 4| \\ |1 & 4| & -|2 & 4| & |2 & 1| \\ -|2 & 2| & |4 & 2| & -|4 & 2| \\ |1 & 4| & |2 & 4| & -|2 & 1| \\ |2 & 2| & -|4 & 2| & |4 & 2| \\ |4 & 1| & -|2 & 1| & |2 & 4| \end{pmatrix}}{36} = \frac{\begin{pmatrix} 15 & -6 & -6 \\ -6 & 12 & 0 \\ -6 & 0 & 12 \end{pmatrix}}{36} =$$

$$= \begin{pmatrix} \frac{5}{12} & -\frac{1}{6} & -\frac{1}{6} \\ -\frac{1}{6} & \frac{1}{3} & 0 \\ -\frac{1}{6} & 0 & \frac{1}{3} \end{pmatrix}$$

$$A = \begin{pmatrix} \frac{5}{12} & -\frac{1}{6} & -\frac{1}{6} \\ -\frac{1}{6} & \frac{1}{3} & 0 \\ -\frac{1}{6} & 0 & \frac{1}{3} \end{pmatrix} \cdot \begin{pmatrix} 12 & 0 & 0 \\ 0 & 12 & 0 \\ 0 & 0 & 12 \end{pmatrix}$$

$$A = \begin{pmatrix} 5 & -2 & -2 \\ -2 & 4 & 0 \\ -2 & 0 & 4 \end{pmatrix}$$