3. ~~A~~ def A^{-1} : $AA^{-1} = A^{-1}A = \mathbb{1}$

podm : A regulární

(v) $\det A \neq 0$

(v) $h(A)$ je maximální možná $(=m)$ v $\mathbb{R}^m$

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b) $\begin{vmatrix} 4 & 2 & -2 \\ 2 & 1 & 3 \\ \lambda & 1 & -\lambda \end{vmatrix} \neq 0$ $\boxed{\lambda \neq -2}$

$\cancel{-4\lambda} - 4 + 6\lambda + 2\lambda - 12 + \cancel{4\lambda} = 8(\lambda - 2) \neq 0$

c) $\boxed{\lambda = 0}$: $\left(\begin{array}{ccc|ccc} 4 & 2 & -2 & 1 & 0 & 0 \\ 2 & 1 & 3 & 0 & 1 & 0 \\ 0 & 1 & 0 & 0 & 0 & 1 \end{array}\right) \overset{I-2II}{\sim} \left(\begin{array}{ccc|ccc} 4 & 2 & -2 & 1 & 0 & 0 \\ 0 & 0 & -8 & 1 & -2 & 0 \\ 0 & 1 & 0 & 0 & 0 & 1 \end{array}\right) \sim$

$\sim \left(\begin{array}{ccc|ccc} 4 & 2 & -2 & 1 & 0 & 0 \\ 0 & 1 & 0 & 0 & 0 & 1 \\ 0 & 0 & -8 & 1 & -2 & 0 \end{array}\right) \overset{4I-III}{\sim} \left(\begin{array}{ccc|ccc} 16 & 8 & 0 & 3 & 2 & 0 \\ 0 & 1 & 0 & 0 & 0 & 1 \\ 0 & 0 & -8 & 1 & -2 & 0 \end{array}\right) \sim$

$\overset{I-8II}{\sim} \left(\begin{array}{ccc|ccc} 16 & 0 & 0 & 3 & 2 & 8 \\ 0 & 1 & 0 & 0 & 0 & 1 \\ 0 & 0 & -8 & 1 & -2 & 0 \end{array}\right)$ $\underline{\underline{A^{-1} = \frac{1}{16} \begin{pmatrix} 3 & 2 & 8 \\ 0 & 0 & 16 \\ -2 & 4 & 0 \end{pmatrix}}}$

$A^{-1} = \begin{pmatrix} \frac{3}{16} & \frac{2}{16} & \frac{8}{16} \\ 0 & 0 & 1 \\ \frac{-1}{8} & \frac{2}{8} & 0 \end{pmatrix}$

$A \cdot A^{-1} \cdot 16 = \begin{pmatrix} 16 & 0 & 0 \\ 0 & 16 & 0 \\ 0 & 0 & 16 \end{pmatrix}$ ✓

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