

$$A = \begin{pmatrix} -2 & 0 & 1 \\ -2 & 0 & 1 \\ -4 & 0 & 2 \end{pmatrix} \quad \det(A - \lambda \cdot \text{id}_3) \sim \begin{pmatrix} -2-\lambda & 0 & 1 \\ -2 & -\lambda & 1 \\ -4 & 0 & 2-\lambda \end{pmatrix}$$

$$\left(\begin{array}{ccc|cc} -2-\lambda & 0 & 1 & -2-\lambda & 0 \\ -2 & -\lambda & 1 & -2 & -\lambda \\ -4 & 0 & 2-\lambda & -4 & 0 \end{array} \right)$$

$$(-2-\lambda)(-\lambda)(2-\lambda) + 0 + 0 - 4\lambda - 0 - 0$$

$$(+2\lambda + \lambda^2)(2-\lambda) - 4\lambda$$

$$+4\lambda - 2\lambda^2 + 2\lambda^2 - \lambda^3 - 4\lambda$$

$$\lambda^3 = 0 \rightarrow \lambda = 0 \rightarrow \text{unice autovalore } m(0) = 3$$

trovo gli autospazi

$$\text{ker} \begin{pmatrix} -2 & 0 & 1 \\ -2 & 0 & 1 \\ -4 & 0 & 2 \end{pmatrix} \xrightarrow{R_1 = R_1 / -2} \begin{pmatrix} 1 & 0 & -\frac{1}{2} \\ -2 & 0 & 1 \\ -4 & 0 & 2 \end{pmatrix}$$

$$\begin{array}{l} R_2 = R_2 + 2R_1 \\ R_3 = R_3 + 4R_1 \end{array} \rightarrow \begin{pmatrix} 1 & 0 & -\frac{1}{2} \\ 0 & 0 & 0 \\ 0 & 0 & 0 \end{pmatrix} \rightarrow \left\{ \begin{array}{l} x - \frac{1}{2}z = 0 \end{array} \right.$$

$$\left\{ x = \frac{1}{2}z \rightarrow v_0 = \left\langle \begin{pmatrix} 1 \\ 0 \\ 1 \end{pmatrix} \right\rangle \right.$$