P1]

$$A = \begin{bmatrix} 2 & 1 & 0 & 0 \\ 0 & 2 & 0 & 0 \\ 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 2 \end{bmatrix} \quad B = \begin{bmatrix} 2 & 0 & 0 & 0 \\ 0 & 1 & 1 & 0 \\ 0 & 1 & 1 & 0 \\ 0 & 0 & 0 & 2 \end{bmatrix} \quad C = \begin{bmatrix} 0 & 0 & 0 & 0 \\ 0 & 2 & 0 & 0 \\ 0 & 0 & 2 & 0 \\ 0 & 0 & 0 & 2 \end{bmatrix}$$

a) Señalar cuales son diagonalizable, y si lo son, encontrar los valores D y P

A]

$$\det(A - \lambda I) = 0 \iff \det\left(\begin{bmatrix} 2-\lambda & 1 & 0 & 0 \\ 0 & 2-\lambda & 0 & 0 \\ 0 & 0 & -\lambda & 0 \\ 0 & 0 & 0 & 2-\lambda \end{bmatrix}\right) = 0$$

$$\Rightarrow P(\lambda) = (2-\lambda)^3(-\lambda) = 0$$

$\lambda = 2$ multp alg $= 3$

$\lambda = 0$ multp alg $= 1$.

$\underline{\lambda = 0}$.

$$\begin{bmatrix} 2 & 1 & 0 & 0 \\ 0 & 2 & 0 & 0 \\ 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 2 \end{bmatrix} \begin{pmatrix} v_1 \\ v_2 \\ v_3 \\ v_4 \end{pmatrix} = \begin{pmatrix} 0 \\ 0 \\ 0 \\ 0 \end{pmatrix} \Rightarrow \begin{aligned} 2v_1 + v_2 &= 0 \\ 2v_2 &= 0 \\ 0 &= 0 \\ 2v_4 &= 0 \end{aligned}$$