2) $\Omega = \mathbb{R}^2 = \left\{ \begin{bmatrix} a & 0 \\ 0 & 0 \end{bmatrix}, \begin{bmatrix} 0 & b \\ 0 & 0 \end{bmatrix}, \begin{bmatrix} 0 & 0 \\ c & 0 \end{bmatrix}, \begin{bmatrix} 0 & 0 \\ 0 & d \end{bmatrix}, \cdots \right\}$

$$\begin{bmatrix} A & B \\ C & D \end{bmatrix} = \begin{bmatrix} a & 0 & 0 & 0 \\ 0 & 0 & c & 0 \\ 0 & c & 0 & b \\ 0 & d & 0 & 0 \end{bmatrix}$$

E

$E_{rr} = \begin{bmatrix} a & & 0 \\ & b & \\ & & c & d \\ 0 & & \end{bmatrix}$

let $a, b, c, d \neq 0$

$|E| = abcd$

$\neq 0 \rightarrow$ Full Rank

$P(E) = 4$

$\underline{\Omega \ spans \ \mathbb{R}^4}$