$$A = \begin{pmatrix} a_1^1 & \cdots & a_h^1 & \cdots & a_n^1 \\ \vdots & & & & \\ a_1^k & \cdots & a_h^k & \cdots & a_n^k \\ \vdots & & \vdots & & \vdots \\ a_1^m & & a_h^m & & a_n^m \end{pmatrix}$$

$\leftarrow$ riga $\underline{a}^k$

colonna $\underline{a}_h$

1) preso $k \in \{1, \dots, m\}$ e $\lambda \in K \setminus \{0\}$

$$\underline{a}^k \longrightarrow \lambda \cdot \underline{a}^k$$

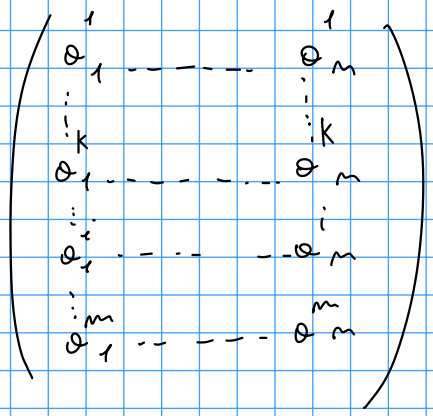
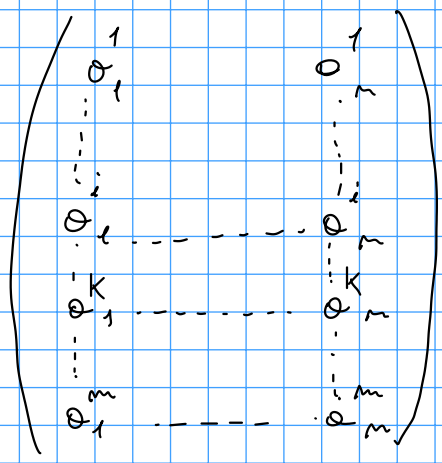
$$B = \begin{pmatrix} a_1^1 & \cdots & a_h^1 & \cdots & a_n^1 \\ \vdots & & & & \\ \lambda a_1^k & \cdots & \lambda a_h^k & \cdots & \lambda a_n^k \\ \vdots & & \vdots & & \vdots \\ a_1^m & & a_h^m & & a_n^m \end{pmatrix}$$

$$\underline{b}^k = \lambda \cdot \underline{a}^k$$

Esempio

$$A = \begin{pmatrix} 2 & 7 \\ -1 & 3 \\ 0 & -5 \end{pmatrix} \qquad \underline{a}^2 \longrightarrow 3 \cdot \underline{a}^2 \qquad B = \begin{pmatrix} 2 & 7 \\ -3 & 9 \\ 0 & -5 \end{pmatrix}$$

2) $\forall k, i \in \{1, \dots, m\}$ $\quad a^k \longleftrightarrow a^i$

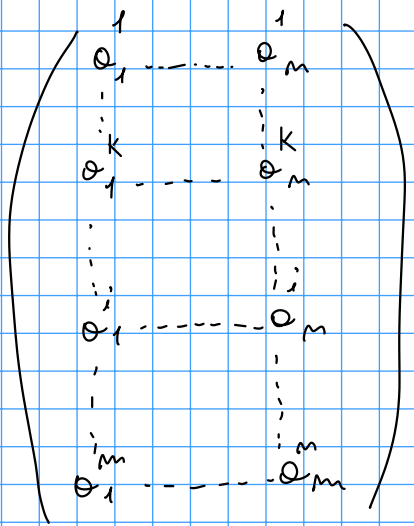
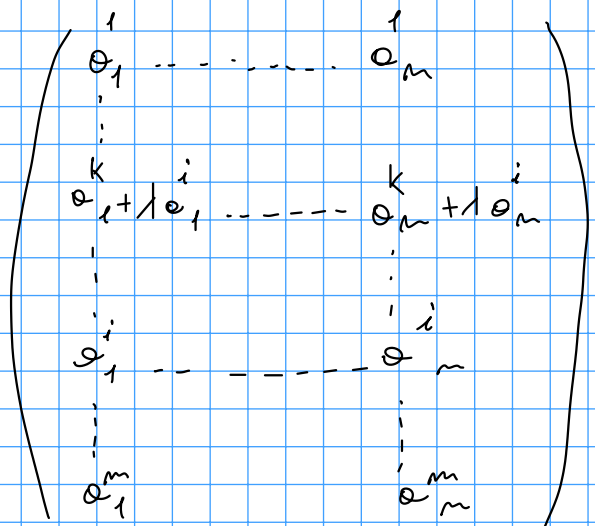
$A =$  $\longrightarrow B =$ 

Esempio

$$A = \begin{pmatrix} 2 & 4 \\ -1 & 3 \\ 0 & -5 \end{pmatrix} \qquad \underline{a^1} \longleftrightarrow \underline{a^3} \qquad B = \begin{pmatrix} 0 & -5 \\ -1 & 3 \\ 2 & 4 \end{pmatrix}$$

3) $\forall k, i \in \{1, \dots, m\}$ $\quad k \neq i$, $\lambda \in K$

$$a^k \longrightarrow a^k + \lambda a^i$$

$A =$  $\dashrightarrow B =$ 

Esempio:

$$A = \begin{pmatrix} 2 & 7 \\ -1 & 3 \\ 0 & -5 \end{pmatrix}$$

$$B = \begin{pmatrix} 2 & 7 \\ 0 & 13/2 \\ 0 & -5 \end{pmatrix}$$

$K = 2$, $i = 1$, $\alpha = 1/2$

$\underline{a}^2 \to \underline{a}^2 + \frac{1}{2}\underline{a}^1 = (-1, 3) + \frac{1}{2}(2, 7) =$

$= (0, 13/2)$