# M05- matr. inv. non quadrata

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## MATRICI INVERSE DI MATRICI NON QUADRATE

$$A_{(2\times3)} = \begin{pmatrix} 1 & 2 & -1 \\ 0 & 1 & 2 \end{pmatrix}$$

$$A \times A_{dx}^{-1} = I$$

$(2\times3)\ (3\times2)\ (2\times2)$

$$\begin{pmatrix} 1 & 2 & -1 \\ 0 & 1 & 2 \end{pmatrix} \times \begin{pmatrix} a & d \\ b & e \\ c & f \end{pmatrix} = \begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix}$$

$$\begin{cases} 1\cdot a + 2b + (-1)\cdot c = 1 \\ 0\cdot a + 1\cdot b + 2\cdot c = 0 \end{cases} \qquad \begin{cases} 1\cdot d + 2\cdot e + (-1)\cdot f = 0 \\ 0\cdot d + 1\cdot e + 2\cdot f = 1 \end{cases}$$

$$\begin{cases} a + 2b - c = -1 \\ b + 2c = 0 \end{cases} \qquad \begin{cases} d + 2e - f = 0 \\ e + 2f = 1 \end{cases}$$

$b = -2c$

$e = -2f + 1$

$a + 2(-c) - c = -1$

$a - 2c - c = -1$

$a = 3c + 1$

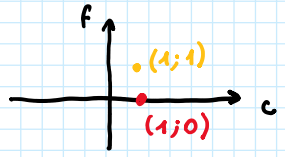
$d + 2(-2f+1) - f = 0$

$d - 4f + 2 - f = 0$

$d = 5f - 2$

$$A^{-1} = \begin{pmatrix} a & d \\ b & e \\ c & f \end{pmatrix} = \begin{pmatrix} 3c+1 & 5f-2 \\ -2c & -2f+1 \\ c & f \end{pmatrix}$$

$\infty$ MATRICI INVERSE A DX




$$A^{-1} = \begin{pmatrix} 4 & -2 \\ -2 & 1 \\ 1 & 0 \end{pmatrix} \qquad A^{-1} = \begin{pmatrix} 4 & 3 \\ -2 & -1 \\ 1 & 1 \end{pmatrix}$$

$\infty^2$ MATRICI INVERSE

INVERSA SINISTRA

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

$$A_{sx}^{-1} \cdot A = I$$

$(3\times2)\ (2\times3)\ (3\times3)$

$$\begin{pmatrix} a & b \\ c & d \\ e & f \end{pmatrix} \times \begin{pmatrix} 1 & 2 & -1 \\ 0 & 1 & 2 \end{pmatrix} = \begin{pmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{pmatrix}$$

$$\begin{cases} \textcircled{1}\ \{\ 1\cdot a + b\cdot 0 = 1 & a\cdot 2 + b\cdot 1 = 0 & a(-1) + b\cdot 2 = 0 \\ \textcircled{2}\ \{\ c\cdot 1 + d\cdot 0 = 0 & c\cdot 2 + d\cdot 1 = 1 & c(-1) + d\cdot 2 = 0 \\ \textcircled{3}\ \{\ e\cdot 1 + f\cdot 0 = 0 & e\cdot 2 + f\cdot 1 = 0 & e\cdot(-1) + f\cdot 2 = 1 \end{cases}$$

$A^{-1}_{sx}$ NON esiste!!!

$$\textcircled{1}\ \begin{cases} a = 1 \\ 2a + b = 0 \rightarrow 2 + b = 0 \rightarrow b = -2 \\ -a + 2b = 0 \rightarrow -1 + 2b = 0 \rightarrow b = 1/2 \end{cases}$$ contraddizione

↓

sist. impossibile!