

Example III.26 (Feldman's notes)

$$\det \begin{bmatrix} 1 & 2 & 3 & 4 \\ 4 & 3 & 2 & 1 \\ 2 & 3 & 3 & 3 \\ 7 & 8 & 9 & 12 \end{bmatrix} \stackrel{A}{=} \det \begin{bmatrix} 1 & 2 & 3 & 4 \\ 0 & -5 & -10 & -15 \\ 0 & -1 & -3 & -5 \\ 0 & -6 & -12 & -16 \end{bmatrix} \begin{array}{l} (1) \\ (2) - 4(1) \\ (3) - 2(1) \\ (4) - 7(1) \end{array}$$

$$\stackrel{C1}{=} \det \begin{bmatrix} -5 & -10 & -15 \\ -1 & -3 & -5 \\ -6 & -12 & -16 \end{bmatrix}$$

$$\stackrel{M}{=} -5 \det \begin{bmatrix} 1 & 2 & 3 \\ -1 & -3 & -5 \\ -6 & -12 & -16 \end{bmatrix}$$

$$\stackrel{A}{=} -5 \det \begin{bmatrix} 1 & 2 & 3 \\ 0 & -1 & -2 \\ 0 & 0 & 2 \end{bmatrix} \begin{array}{l} (1) \\ (2) + (1) \\ (3) + 6(1) \end{array}$$

$$\stackrel{D}{=} (-5)\{1 \times (-1) \times 2\} = 10$$