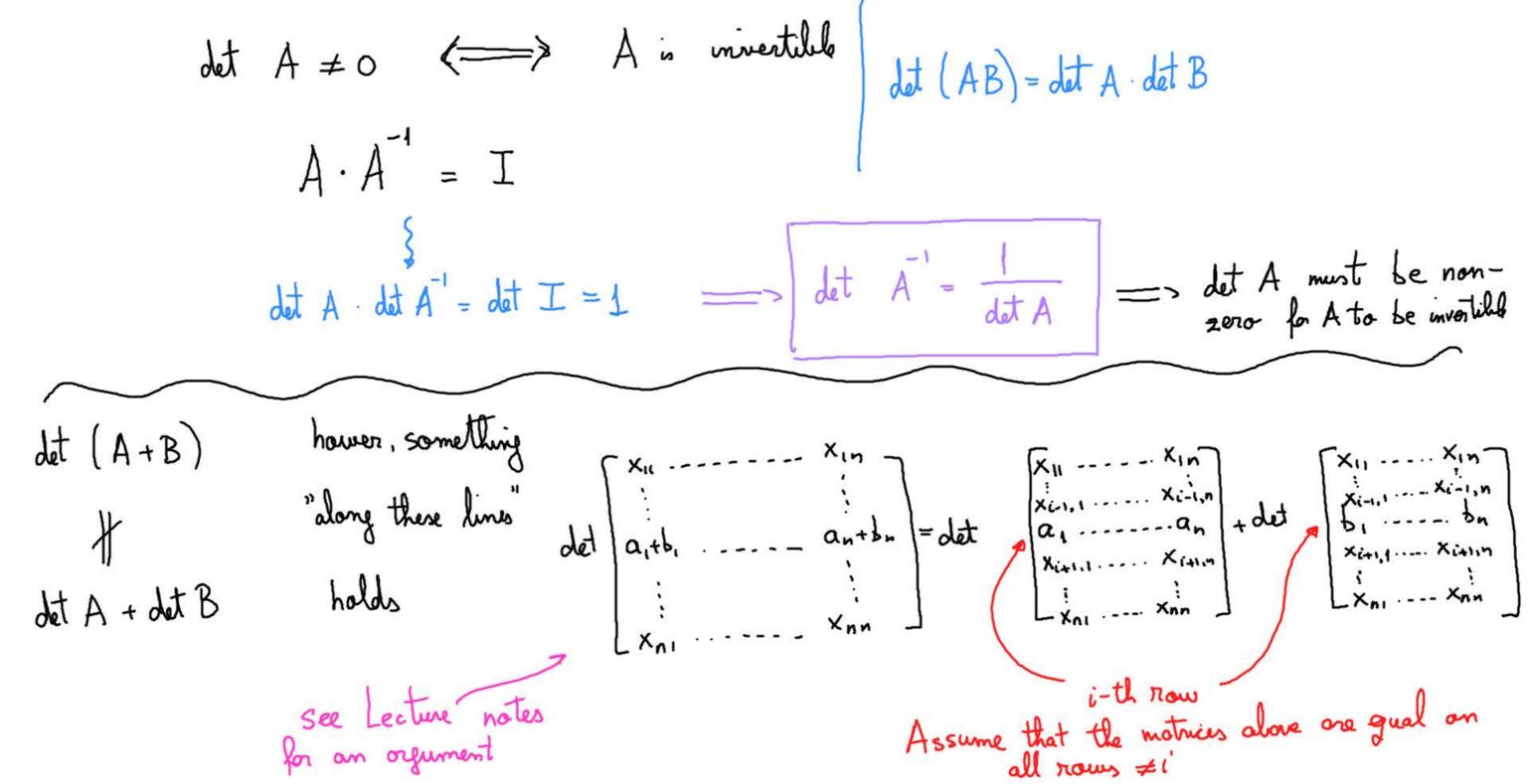
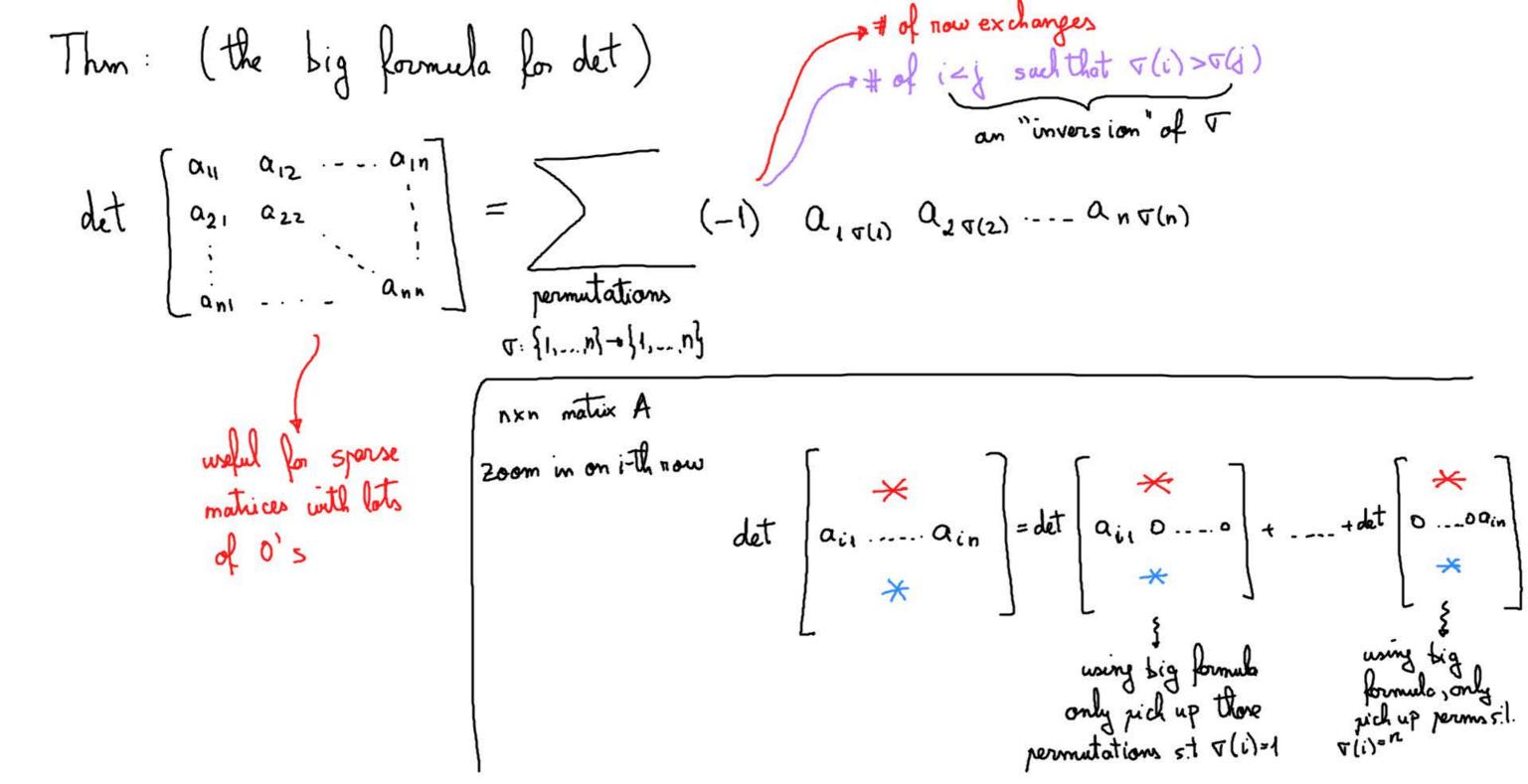
moduct of pivots of REF(A) Determinant of an nxn matrix A A singular det A = 0 (=> REF(A) has a full now of (=> rows of A one linearly dependent what if REF(A) has a full row of zeroes, i.e. no pirot on some now? det A = 0 (=) columns of A one linearly dependent (rows of AT) · for the surpose of This formula, the "pivot" on a full o row is taken to be o det A = det A Rank A < n <=> A fails to be investible



"the big formulo" for det A = det - a₁₂ a₂₁ b/c diagonal after row exchange anazz b/c diagonal b/c full column of 0's b/c full column of 0's

a 11 a 22 - a 12 a 21

21 Terms one o We their columns + are dependent $= \det \begin{bmatrix} a_{11} & 0 & 0 \\ 0 & a_{22} & 0 \\ 0 & 0 & a_{33} \end{bmatrix} + \det \begin{bmatrix} 0 & a_{12} & 0 \\ 0 & 0 & a_{23} \\ a_{31} & 0 & 0 \end{bmatrix} + \det \begin{bmatrix} 0 & 0 & a_{13} \\ a_{21} & 0 & 0 \\ 0 & a_{32} & 0 \end{bmatrix}$ $\{1,2,3\} \rightarrow \{1,2,3\}$ $\{1,2,3\} \rightarrow \{2,3,1\}$ $\{1,2,3\} \rightarrow \{3,1,2\}$ $+ \det \begin{bmatrix} a_{11} & 0 & 0 \\ 0 & 0 & a_{23} \\ 0 & a_{32} & 0 \end{bmatrix} + \det \begin{bmatrix} 0 & a_{12} & 0 \\ a_{21} & 0 & 0 \\ 0 & 0 & a_{33} \end{bmatrix} + \det \begin{bmatrix} 0 & 0 & a_{13} \\ 0 & a_{22} & 0 \\ a_{31} & 0 & 0 \end{bmatrix}$ - a 11 a 23 a 32 - a 12 a 21 a 33 - a 13 a 22 a 31 {1,2,3}-{1,3,2} {1,2,3}-[2,1,3] {1,2,3}-[3,2,1] (formula above gives the same answer as the diagonals method / Sorrus' rule for computing det (3×3)) # of terms = 6 = 3!



COFACTOR EXPANSION: