

$$\left\| \begin{pmatrix} a_{11} & a_{12} \\ a_{21} & a_{22} \end{pmatrix} \right\|^2 = \frac{1}{2} (a_{11}^2 + a_{12}^2 + a_{21}^2 + a_{22}^2) + \sqrt{a_{11}^4 + a_{12}^4 + a_{21}^4 + a_{22}^4 + 2a_{11}^2 a_{12}^2 + 2a_{21}^2 a_{22}^2 + 2a_{11}^2 a_{21}^2 + 2a_{12}^2 a_{22}^2 - 2a_{21}^2 a_{12}^2 - 2a_{11}^2 a_{22}^2 + 8a_{11} a_{12} a_{21} a_{22}}$$