

1032-15-56

David C Torney* (dtorney@valornet.com), 5 Sky High Way, Jemez Springs, NM 87025. *A Generalization of Hilbert Matrices.*

Consider $\mathcal{H}_\xi \stackrel{\text{def}}{=} [\text{sgn}(a_i - b_j)|a_i - b_j|^{-\xi}]$; a_i, b_j and $\xi \in \mathbb{R}; 1 \leq i, j \leq n \in \mathbb{N}$: a generalization of Hilbert matrices. When no a_i equals any b_j and when $0 < \xi$, a necessary and sufficient condition for the non-singularity of \mathcal{H}_ξ is that the a_i 's and b_j 's are distinct. It follows, for $0 < \xi$, that $\text{sgn}(\det \mathcal{H}_\xi)$ is antisymmetric on the latter parameters. For $\xi \leq 0$, there exist singular \mathcal{H}_ξ 's with distinct a_i 's and b_j 's (and no a_i equal any b_j), as illustrated by an $\mathcal{H}_{-1/3}$ of order three. (Received August 05, 2007)