skew Hadamard matrix

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A Hadamard matrix H is *skew Hadamard* if $H + H^T = 2I$.

A collection of skew Hadamard matrices, including at least one example of every order $n \leq 100$ and also including every equivalence class of order ≤ 28, is available `http://www.rangevoting.org/SkewHad.html`at this web page. It has been conjectured that one exists for every positive order divisible by 4.

Reid and Brown in 1972 showed that there exists a "doubly regular tournament of order n" if and only if there exists a skew Hadamard matrix of order n+1.

References

[1] S. Georgiou, C. Koukouvinos, J. Seberry, *Hadamard matrices, orthogonal designs and construction algorithms*, pp. 133-205 in DESIGNS 2002: Further computational and constructive design theory, Kluwer 2003.

[2] K.B. Reid, E. Brown, *Doubly regular tournaments are equivalent to skew Hadamard matrices*, J. Combinatorial Theory A 12 (1972) 332-338.

[3] J. Seberry, M.Yamada, *Hadamard matrices, sequences, and block designs*, pp. 431-560 in Contemporary Design Theory, a collection of surveys (J.H.Dinitz & D.R.Stinson eds.), Wiley 1992.