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Bruce Reznick* (reznick@math.uiuc.edu), 1409 W. Green St., Urbana, IL 61801. *Constructing Hilbert identities*. Preliminary report.

We will present methods, old and new, for constructing real identities of the form

$$(x_1^2 + \cdots + x_n^2)^r = \sum_{k=1}^N \lambda_k (c_{k1}x_1 + \cdots + c_{kn}x_n)^{2r}, \quad (1)$$

with a particular emphasis on minimizing N and the number of different c_{kj} 's. Among many other applications, these give isometric copies of ℓ_2^n in ℓ_{2r}^N . (Received January 25, 2010)