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Matrices over orders in algebraic number fields as sums of k-th powers

David R. Richman proved that for $n \geq k \geq 2$ every integral $n \times n$ matrix is a sum of seven k-th powers. In this paper, we, in the light of a question raised earlier by M. Newman for the ring of integers of an algebraic number field, obtain a discriminant criterion for every $n \times n$ matrix $(n \geq k \geq 2)$ over an order of an algebraic number field to be a sum of (seven) k-th powers.

References:

1. M. Newman, Sums of squares of matrices, Pacific J. Math. 118 (1985),497-506.

2. D. R. Richman, The Waring problem for matrices, Linear and Multi. Alg. 22(1987).171-192