

Decomposition of integer powers of a mersenne number into binomial coefficients

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$$M^n(k) = (2^k - 1)^n = \sum_{1 \leq i, j, \dots, s \leq k} C_k^i C_k^j \dots C_k^s$$

Here $m(k)$ is the k -th number of Mersenne.
The quantity of indices for which the summing is performed is equal to n .