
DARTMOUTH COLLEGE

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COUNTEREXAMPLE TO EULER’S CONJECTURE ON SUMS OF LIKE POWERS

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A direct search on the CDC 6600 yielded

$$27^5 + 84^5 + 110^5 + 133^5 = 144^5$$

as the smallest instance in which four fifth powers sum to a fifth power. This is a counterexample to a conjecture by Euler [1] that at least \( n \) \( n \)th powers are required to sum to an \( n \)th power, \( n > 2 \).

REFERENCE