# Tom's Query: Perfect n-bics?

**Abstract:** A number theory query related to Fermat's last theorem in higher dimensions.
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When I first encountered Fermat's Last Theorem [$\nexists\ n>2 : m_1^n + m_2^n = m^n$, where $n, m$ and $m_i$ are integers] more than 50 years ago, I posed the query,

are there positive integers $m_i, m$ such that $m_1^3 + m_2^3 + m_3^3 = m^3$ ?

Or, more generally, positive integers $m, m_i$ and $N>2$ such that

$$\sum_{i=1}^{N} m_i^N = m^N \quad ?$$

I immediately found one example: $3^3 + 4^3 + 5^3 = 6^3$ (27 + 64 + 125 = 216, a perfect cu-bic) but since then have had no time to pursue the matter further.

**Query**: has anyone worked on this problem?
**Challenge**: examples of perfect n-bics for n≥3