A0792

√894

Maximum product of an optimum partition of N

m0556 - A0792

1, 2, 3, 4, 6, 9, 12, 18, 27, 36, 54, 81, 108, 162,

243, 324, 486, 729, 972, 1458, 2187, 2916, 4374,

6561, 8748, 13122, 19683, 26244, 39366, 59049,

78732, 118098, 177147, 236196, 354294, 531441, [1, 2]

if $N \equiv 0 \bmod 3$ then $3^{N/3}$

if $N \equiv 1$ then $4 \cdot 3^{(N-4)/3}$

if $N \equiv 2$ then $2 \cdot 3^{(N-2)/3}$

Given a positive Integer N, partioned into positive integers,

$$N = \sum_{1 \le i \le k} x_i,$$

what is the maximum value of the product

$$\prod_{1 \le i \le k} x_i \; ?$$

Ref: Paul R. Halmos, Problems for Mathematicians Young and Old, Dolciani Math'l Expositions Nbr 12, MMA, 1991 pg 30-31 & 188.