Problem of the Week-1: Sum of the Products

Let $A = \{2, 3, 5, 7, 11, 13\}$ and let $A_1, A_2, \ldots, A_{63}$ be all the non-empty subsets of A. Let $f(M) = \prod_{m \in M} m$ denote the product of all the elements in the set M. Compute the sum $\sum_{i=1}^{63} f(A_i)$.

As always, show your work, explain and justify your answer.

Posting Date 1/16/12. Submit solutions to Noah Aydin, Mathematics Department, RBH 319 (e-mail or hard-copy, but hard copy submissions must include a time stamp) by 4 pm on 1/27/12.