

An extension of a theorem of D. H. Lehmer

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Abstract. Given a set of primes $2 = q_1 < q_2 < \cdots < q_t$, let Q be the set of all numbers of the form $q_1^{\alpha_1} q_2^{\alpha_2} \cdots q_t^{\alpha_t}$, where $\alpha_i \geq 0$. Lehmer has given necessary and sufficient conditions to determine when both of the integers S and $S + k$, with $k = 1, 2$ or 4 , belong to Q . In addition, he has provided upper bounds for the number of pairs of such integers contained in Q , and for the largest value of S . We extend these results to the case when k is an odd prime.

