Let $n > 6$ be a perfect number, and let $n = p_1^{e_1} \cdots p_k^{e_k}$ be its prime factorization with $1 < p_1 < \ldots < p_k$. Prove that e_1 is an even number.

A number n is *perfect* if $s(n) = 2n$, where $s(n)$ is the sum of the divisors of n.