Fact 1 Let a, b, c be positive integers. If $a|c$ and $b|c$ and $\mathrm{GCD}(a, b) = 1$, then $ab|c$.

Fact 2 (see exercise 8.7.13 (1.9.18) in Biggs Let a, b be integers such that $\mathrm{GCD}(a, b) = 1$. Suppose that ab is a k:th power, for some fixed $k > 1$. Then each of a and b is a k:th power.