

$= p - 1$, that is , $2^{p-1} \equiv 1 \pmod{p^2}$) and thus p is a Wieferich prime . This also implies that Wieferich primes can be defined as primes p such that the multiplicative orders of 2 modulo p and modulo p^2 coincide : $\text{ord}_{p^2} 2 =$