1056-11-1554   **Jennifer Paulhus*** (`paulhus@math.ksu.edu`), Department of Mathematics, 138 Cardwell Hall, Kansas State University, Manhattan, KS 66506, and **Todd Cochrane** and **Christopher Pinner**. *On the parity of k-th powers mod p.*

Given a prime p, Lehmer asked for the number N_{-1} of even residues in $\mathbb{Z}/p$ whose inverse is odd modulo p. Zhang proved that $N_{-1} \sim p/4$. We consider a more general problem: given k, A any integers with p not dividing A, determine the number N_k of even residues such that Ax^k is odd modulo p. In this more general case, N_k is not always asymptotic to $p/4$. We briefly discuss the use of exponential sum methods to prove many cases where $N_k \sim p/4$ as well as highlight a few examples where bias occurs. (Received September 22, 2009)

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