

1046-11-115

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Let  $E$  be an elliptic curve over the rational numbers. For each rational prime  $p$ , let  $N_p$  denote the number of points on  $E$  reduced modulo  $p$ . We computationally investigate the distribution of primes,  $p$ , such that  $N_p$  is a quadratic residue modulo  $p$ . The primes appear to satisfy a Dirichlet-like uniform distribution for elliptic curves without complex multiplication. This investigation is motivated by a similar conjecture, due to Weston, about the distribution of primes having  $a_p$  a quadratic residue. (Received July 25, 2008)