1026-11-106   **Lillian B. Pierce*** (`lbpierce@princeton.edu`), Fine Hall, Department of Mathematics, Princeton University, Princeton, NJ 08544. *Bounding the 3-part of class numbers of quadratic fields via the square sieve.*

Recently several nontrivial bounds for the 3-part of class numbers of quadratic fields have been proved. We discuss several of the first methods developed, focusing on a method involving the square sieve. Bounding the 3-part can be reduced to the problem of counting the number of squares of the form $4x^3 - dz^2$, where d is a square-free positive integer, and x and z are integers in the ranges $x \ll d^{1/2}, z \ll d^{1/4}$. This counting problem is nontrivial because of the disproportionate ranges of the variables. We show that a variant of the square sieve in combination with the q-analogue of van der Corput's method allows one to tackle such a counting problem successfully. (Received February 20, 2007)