**Louboutin, S.**; **Mollin, R. A.**; **Williams, H. C.**

**Class numbers of real quadratic fields, continued fractions, reduced ideals, prime-producing quadratic polynomials and quadratic residue covers.** (English) Zbl 0771.11039

Can. J. Math. 44, No. 4, 824-842 (1992).

The authors prove various results concerning the connection between prime-producing quadratic polynomials and quadratic number fields with class number one. Let $d$ be a positive square-free integer, $f_d(X) = -X^2 + X + (d-1)/4$ or $f_d(X) = -X^2 + d$ and $\Delta = d$ or $\Delta = 4d$, according as $d \equiv 1 \bmod 4$ or $d \not\equiv 1 \bmod 4$. Then the main result of the paper asserts the equivalence of the following three conditions: (1) No prime $p < \sqrt{\Delta}/2$ splits $\mathbb{Q}(\sqrt{d})$; (2) If $p < \sqrt{\Delta}/2$ is a prime and $1 \leq x < \sqrt{\Delta}/2$ satisfies $f_d(x) \equiv 0 \bmod p$, then $p \mid \Delta$; (3) $\Delta$ is a discriminant of extended Richaud-Degert-type.

Reviewer: Franz Halter-Koch (Graz)

**MSC:**

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|---|---|
| 11R11 | Quadratic extensions |
| 11R29 | Class numbers, class groups, discriminants |
| 11N32 | Primes represented by polynomials; other multiplicative structures of polynomial values |
| 11A41 | Primes |



**Keywords:**

prime-producing quadratic polynomials; quadratic number fields; class number one

**Full Text:** DOI