

Mersenne Primes in Real Quadratic Fields

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The concept of Mersenne primes is studied in real quadratic fields of class number 1. Computational results are given. The field $\mathbb{Q}(\sqrt{2})$ is studied in detail with a focus on representing Mersenne primes in the form $x^2 + 7y^2$. It is also proved that x is divisible by 8 and $y \equiv \pm 3 \pmod{8}$ generalizing the result of F Lemmermeyer, first proved in [LS] using Artin's Reciprocity law.

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