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Nils Bruin* (nbruin@sfu.ca), Department of Mathematics, Simon Fraser University, Burnaby, BC V5A 1S6, Canada. *Imaginary quadratic class numbers and Sha for congruent number curves*. Preliminary report.

We consider two number theoretic problems that have their roots in classical questions. For primes p we ask what is

- (1) the power of 2 dividing the class number of $\mathbb{Q}(\sqrt{-p})$,
- (2) the power of 2 dividing the order of $\text{Sha}(E_p)$,

where E_p is the congruent number curve given by the equation $y^2 = x^3 - p^2x$.

It is already known that partial answers to these questions are governed by the splitting of p in some fixed octic number field. We give an easily computed criterion that provides a next step in the classification of primes p according to questions (1) and (2). As a simple example, the criterion allows us to show that $10^{200} + 16737$ is not a congruent prime. (Received September 21, 2011)