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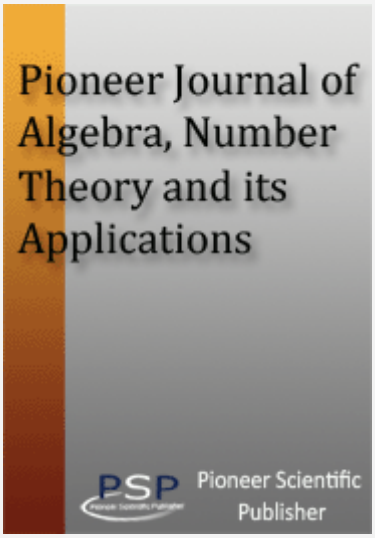

A CONGRUENT TWIN NUMBER PROBLEM

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Abstract

Four elementary characterizations of congruent numbers are reviewed. The fourth criterion, proposed by Koblitz, is invalidated through a counterexample and modified to a correct version. It plays an essential role in a newly defined congruent twin number problem. Congruent twins are studied following a geometric and an algebraic approach. First, the correspondence between congruent numbers and elliptic curves is exploited. Then, the known free abelian group structure of the set of all primitive Pythagorean triples is used to discuss the question of enumeration and algorithmic construction of congruent twin numbers.

Keywords and phrases: congruent number, elliptic curve, congruent twin pair, congruent twin surface, free abelian group of primitive Pythagorean triples.