

**Explicit estimates on a theorem of Shioda concerning the ranks
of curves given by $y^2 = x^3 - a^2x + m^2$**

By P. GARY WALSH (Ottawa)

Abstract. Numerous papers in the literature contain results on the ranks of elliptic curves which generalize a theorem of Brown and Myers on $y^2 = x^3 - x + m^2$ in various ways. We have recently proven an effective version of a generalization which subsumes most of what has appeared in the literature on this topic, although the bounds have not been worked out explicitly. We consider here the subfamily $y^2 = x^3 - a^2x + m^2$, give explicit lower bounds for m in terms of a for such a curve to have rank at least 2, and show how these lower bounds are influenced by the *abc* conjecture.

P. GARY WALSH
DEPARTMENT OF MATHEMATICS
UNIVERSITY OF OTTAWA
CANADA

Mathematics Subject Classification: 11G05.

Key words and phrases: elliptic curve, rank, torsion subgroup.