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Gareth E Roberts* (groberts@radius.holycross.edu), Dept. of Mathematics and CS,
College of the Holy Cross, 1 College Street, Worcester, MA 01610, and **Lisa Melanson**. *Saari's
Conjecture for the Restricted Three-body Problem.*

In 1970, Don Saari conjectured that every solution to the Newtonian n -body problem that has a constant moment of inertia (constant size) must be a relative equilibrium (rigid rotation). This conjecture, adapted to the restricted three-body problem, is proven analytically using Bernstein-Khovanskii-Kushnirenko (BKK) theory. Specifically, we show that it is not possible for a solution of the planar, circular, restricted three-body problem to travel along a level curve of the amended potential function unless it is fixed at a critical point (one of the five libration points.) Due to the low dimension of the problem, our proof does not rely on the use of a computer. (Received September 22, 2006)