ICM 1998, Berlin, Aug. 18–27

Abstracts of Short Communications and Posters

Section:

6. Topology

1991 MS Classification: 57M25
Hass, Joel, University of California, Davis USA and Lagarias, Jeff, AT&T Research, USA

The number of Reidemeister Moves Needed for Unknotting

There is a positive constant c_1 such that for any diagram $\mathbf{D}$ representing the unknot, is a sequence of at most $2^{c_1 n}$ Reidemeister moves that will convert it to a trivial knot diagram, where n is the number of crossings in $\mathbf{D}$. A similar result holds for elementary moves on a polygonal knot K embedded in the 1-skeleton of the interior of a compact triangulated orientable PL 3-manifold M. There is a positive constant c_2 such that for each $t \geq 1$, if M consists of t tetrahedra, and K is unknotted, then there is a sequence of at most $2^{c_2 t}$ elementary moves in M which transforms K to a triangle contained inside one tetrahedron of M. We obtain explicit values for c_1 and c_2.