

Homework 5

Math 139

DUE: Thursday March 15, 2007.

Reference: Knots and Links Chapter 4.

1. Give an example to show that a decomposition of a prime knot into two non-trivial 2-tangles need not be unique.
2. Show that both of the tangles in Figure 4.12 (p. 98 of Knots and Links) are non-trivial. (Hint: the trefoil knot is nontrivial.)
3. Find a decomposition of the trivial knot into two 2-tangles, one of which is non-trivial.
4. Show that rational links have one or two components.
5. Show that 1-bridge links are trivial.
6. Show that 2-bridge links are rational and, more generally, an n -bridge link can be decomposed into two trivial n -tangles.
7. Show that rational knots are prime. (Hint: look at the intersection of a factorizing sphere and the sphere defining the trivial tangles.)