Brian Hunt Knot THeory-Asst. 2

Prob 3.1.2

Show that the given knot is equivalent to the unknot by performing a series of unknots.

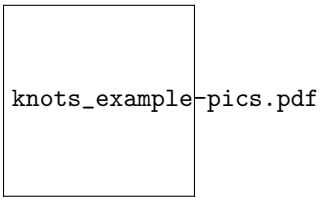

Figure 1: Here we perform steps of Reidemeister moves to show that this is equivalent to the unknot.

Prob 3.2.5

Part a)

For the Reidemeister move 1 we obviously don't change linking numbers since this is just an untwisting. Even if the twisting crosses over another link, by performing a R2 move to seperate them we get a link with no crossing and we have the same linking number if R2 works. So we must look at R2 and R3. These are performed on the next page as Fig 2.diagram.

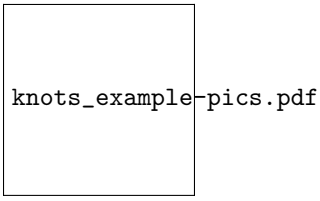

Figure 2: Reidemeister moves 2 and 3 to show that the linking number is invarient to any R move that we can make on any 2 links. Obviously this also applies to more than 2 links by making sure each triangle only passes through 1 link at a time.

Part b)

Show that the Whitehead Link has linking number 0. See figure on following page - Fig. 3.

Part c)

Two examples that have linking numbers of 3 and 4. See last page(Fig. 4)

Question for the assignment: For this I think an interesting one would be the one the book mentions: What is the least number of Reidemeister moves that is required to transition the knot for Prob. 3.1.2 into the unknot and can

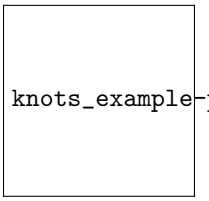

Figure 3: Simply by putting the appropriate linking number of 1 we show that it is 0.

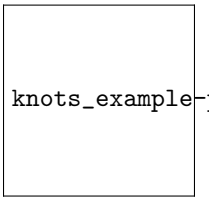

Figure 4: Here are two examples with different linking numbers.

we prove that this is the least number required. I see a method of 5 moves so far.