Michigan Math Club

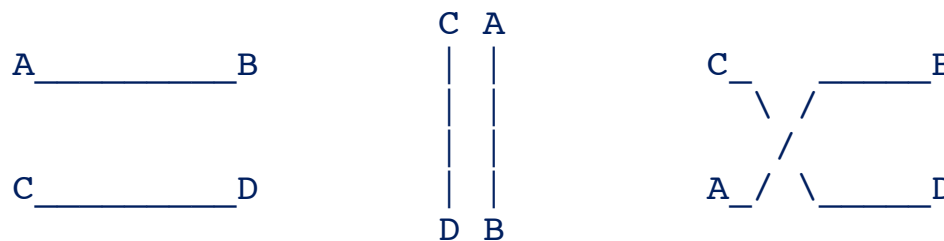## Thursday at 4pm in the Commons
Free Pizza and Pop

Rational Tangles

Martin Strauss ★ 26 March 2015

A rational tangle is made from two ropes, initially untangled, by applying a sequence of TWIST and ROTATE moves:

```
                              C A
A_____B                  | |          C_    ____B
                              | |            \  /
                              | |             /
                              | |           _/  \
C_____D                  | |        A_/    \____D
                              D B
```

Left: initial position P. Center: P after ROTATE. Right: P after twist. Only the left strands may be TWISTed, and only top over bottom.

Though some proofs are beyond the scope of the hour, we will investigate some of the properties. Can you find a way to undo a TWIST by using a sequence of TWISTs and ROTATEs? Can you find a faster way to undo any sequence of TWISTs and ROTATEs? Can you find a 2-rope tangle that can NOT be made from TWISTs and ROTATEs? What's the relationship to the Euclidean Algorithm for GCDs?