# 4-chain can interlock with triangle (closed 3-chain)

6.885
L22.3
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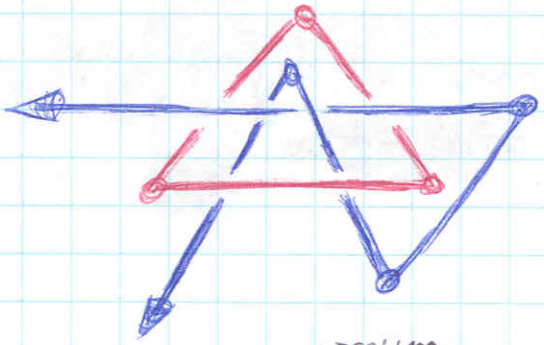
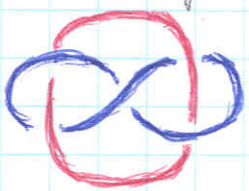
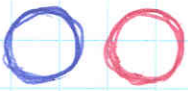
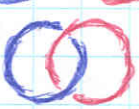


- let origin = circumcenter of triangle (which we view as fixed)
- let $R$ = circumradius of triangle + $\Sigma$ middle two bars of 4-chain
- require end bars to have length $\geq 20R$
- as long as endpoints stay outside ball of radius $15R$ & middle 3 vertices stay inside that ball, can connect endpoints with rope outside ball

↳  $5_1^2$

- consider first violation: two cases
  - if middle vertex about to exit, all middle vertices are $\geq 14R$ away from origin
  - if endpt. about to enter, adjacent vertex is $\geq 5R$ away from origin $\Rightarrow$ others are $\geq 4R$ away.
- what could cross the triangle? (or anything within $4R$ of the origin) the two end bars
- 3 cases:
  - no end bars strike $\Delta$ $\Rightarrow$  $0_1^2$
  - one end bar strikes $\Delta$ $\Rightarrow$  $2_1^2$
  - two end bars strike $\Delta$ $\Rightarrow$ $4_1^2$, or $0_1^2$ (with some argument)
- none of these match original topology but topology can't change before such an event ⨯ □