Links [Ad].
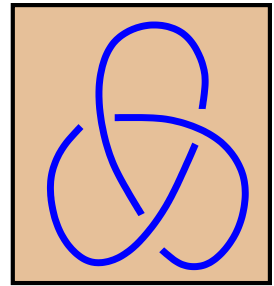
Link diagrams up to planar isotopy and **Reidemeister moves**:

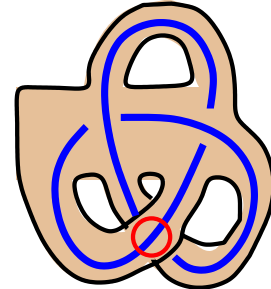$R1:$ $R2:$ $R3:$
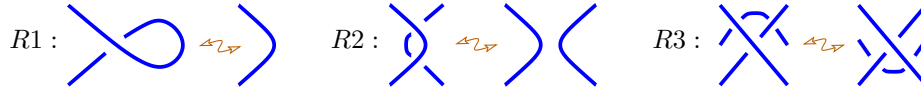
Knot diagram
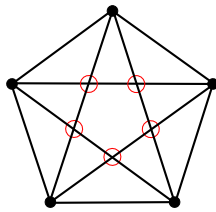
Virtual links [Ka].

Virtual crossing

Virtual knot

Virtual Reidemeister moves:

$V1:$ $V2:$ $V3:$ $V4:$

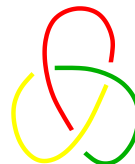**Forbidden moves**: $F1:$ $F2:$

3-colorings of links

Def. A _3-coloring_ of a link diagram is a coloring of its arcs into three colors (red, yellow, green) such that at each crossing the three incident arcs are either all of the same color or all of three different colors.

Theorem. _The number of 3-colorings is a link invariant._

Proof.

$R1:$ $R2:$ $R3:$ □

Example. #3-col($unknot$)=3, #3-col(3_1)=9.

REFERENCES

[Ad]   C. Adams, _The knot book_, AMS, 2001.
[Ka]   L. Kauffman, _Virtual knot theory_, European Journal of Combinatorics, **20** (1999) 663–690.