Knot invariants (Kauffman bracket + Jones polynomial)

Recall R-moves

Sort of obvious theorem, I'm going to call it
Proposition: Two different knot drawings on a planar surface can be transformed one into another by a sequence of R-moves

+ Two drawings of the same (topologically) knot like projections

Faux historical approach

- Vaughan (?) Jones 1985 (Impossible to talk to because he's from New Zealand)

\[ f: K \rightarrow \mathbb{Z} \mathbb{I} \mathbb{I} \mathbb{I} \mathbb{I} = \text{poly}(s \text{ of } t + t^{-1}) \]

\[ f(\text{a}-) + f(\text{a}) = (\phi - \phi^{-1}) f(\text{a}) \]

\[ f(\text{a}) = 1 \]

Theorem: G connected, \( M = M(G) \) medial graph

\[ \sum_{\text{cuts} \in \text{M}(G)} x(y(c)) w(c) = \Delta G(x+1, y+1) \]

Use medial graph to get an alternating knot (or links) by orienting a path through + alternating over under at intersections

+ blue cuts and red cycles

\[ L_k(A \cup B \cup \partial) = \sum A \quad B \quad d \]

(to be lazy, \( \langle \infty \rangle = L_k(A \cup B \cup \partial) \))
Checking recursions for L through cuts, R makes 2 and 3 work fine, but not 1.