

Properties of the Conway polynomial

Proposition: For an oriented link L with $\#L$ components, the Conway polynomial $\nabla_L(z) = \sum_i a_i(L)z^i$ has the following properties:

- (i) If L is split, then $\nabla_L(z) = 0$.
- (ii) $a_i(L) = 0$ for $i = \#L$ modulo 2 and also for $i < \#L - 1$.
- (iii) If L is a knot, then $a_0(L) = 1$.
- (iv) If $\#L = 2$, then $a_1(L) = lk(L)$.
- (v) If L_+ , L_- and L_0 are related in the usual skein-relation-way and $\#L_+ = \#L_- = 1$, then

$$a_2(L_+) - a_2(L_-) = lk(L_0)$$

Proof: See W.B.R. Lickorish *An Introduction to Knot Theory*, page 83 ff.