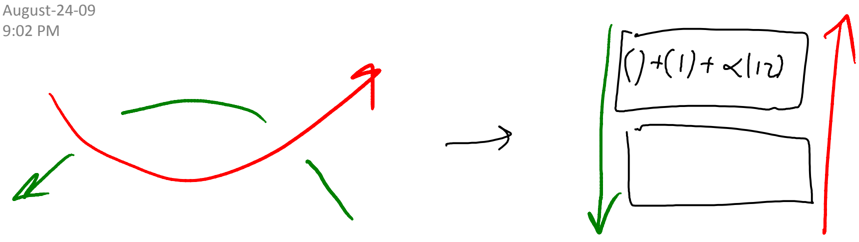
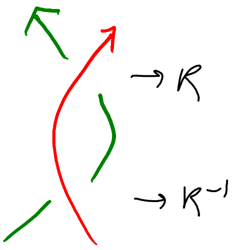
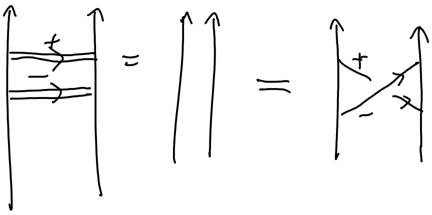
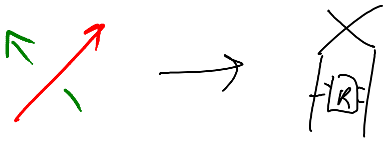
Red over Green

August-24-09
9:02 PM



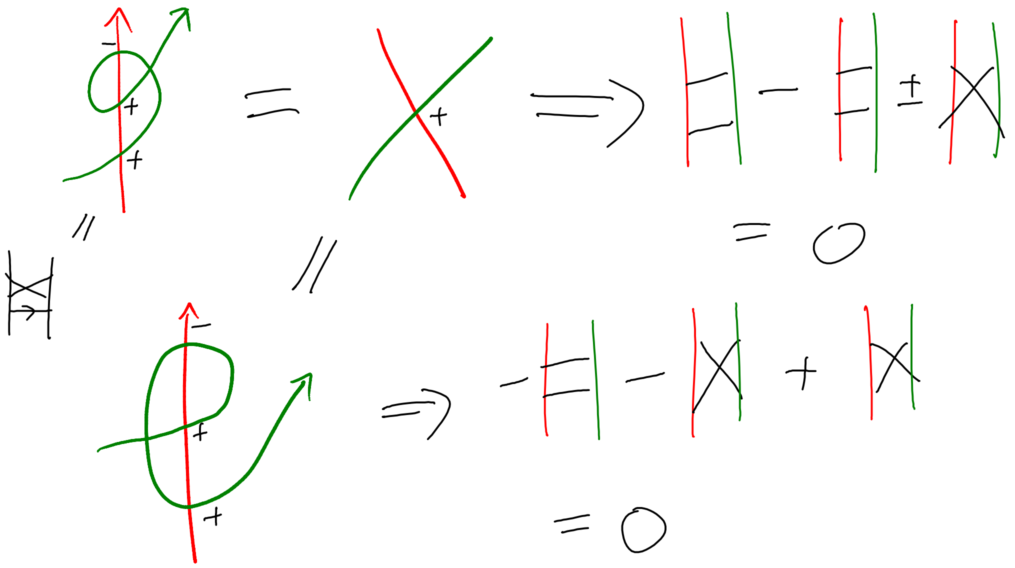






$$R = () + (1) + \alpha(12) + \dots$$

$$R^{-1} = () - (1) + (1-\alpha)(12) + \dots$$



R should satisfy the equation $(R^{-1})^{GT} \cdot R^{GT} = I = ()$
where "GT" means "Transpose the green strand".

A_2 $\begin{cases} R = () + (1) + \alpha(12) + \dots \qquad R^{-1} = () - (1) + (1-\alpha)(12) \\ \text{GT does nothing} \dots \end{cases}$

Forbidden substructures:
$(21) \to (12)$ $\quad$ $(312) \to (123)$

$$R = () + (1) + \alpha(12) + \beta_1(123) + \beta_2(231) + \dots$$

$$R^{-1} = () - (1) + (1-\alpha)(12) + (2\alpha - \beta_1 - 1)(123) - \beta_2(231) + \dots$$

$A_3 =$
$123 = 132 = 213$
$321 = 312 = 231$

$K^{GT} =$ interchange $\beta_1 \rightleftarrows \beta_2$ | $(K^{-1})^{GT} = () - (1) + (1-\alpha)(12) - \beta_2(123) + (2\alpha - \beta_1 - 1)(231)$

$(K^{GT})^{-1} = K^{-1} / \beta_1 \leftrightarrow \beta_2 = () - (1) + (1-\alpha)(12) + (2\alpha - \beta_2 - 1)(123) - \beta_1(231)$

$\Rightarrow -\beta_2 = 2\alpha - \beta_2 - 1, \quad 2\alpha - \beta_1 - 1 = -\beta_1 \quad \Rightarrow$

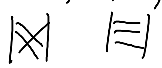
$\alpha = \frac{1}{2}, \qquad \beta_1, \beta_2$ free

Aside $A_4 = \{$

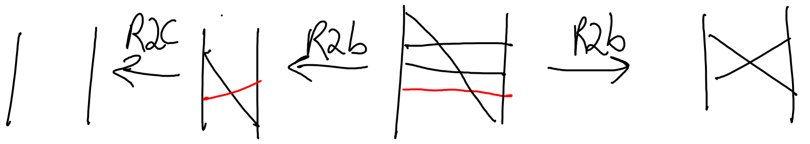
- 1234 = 2134 = 2143 = 1243 = 1324
- 1342 = 1432 = 1423
- 2314 = 3214 = 3124
- 2413
- 3412 = 4312 = 4321 = 3421 = 4231
- 2341 = 3241 = 2431
- 4123 = 4213 = 4132
- 3142

$\}$

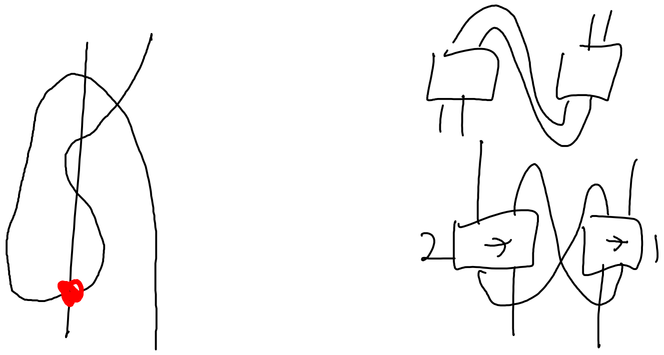
Primitives: (1), (231) − (123),



Can the same xing be involved in both R2b & R2c?



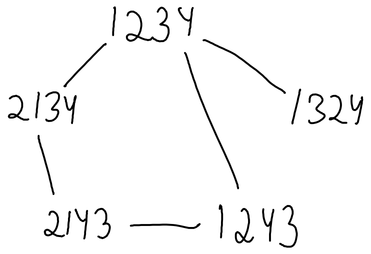
YES.



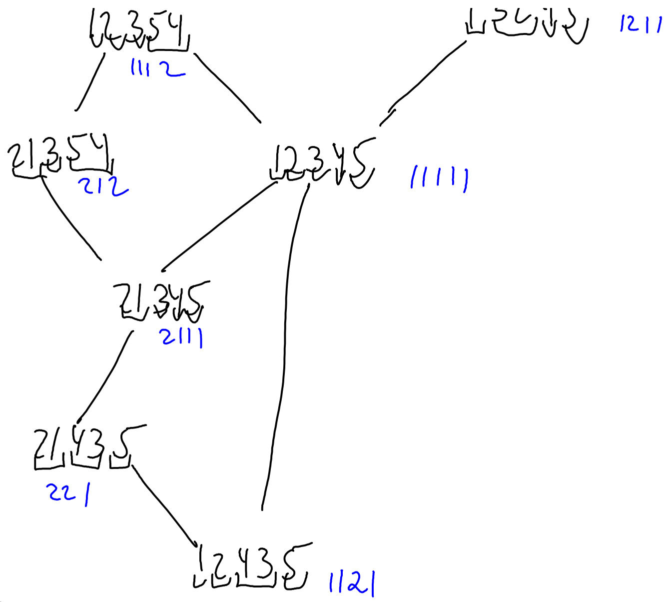
In A, are there relations between relations?
(Square ones, of course. Beyond?)

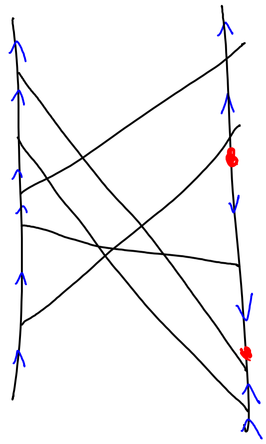
213 ← 123 → 132

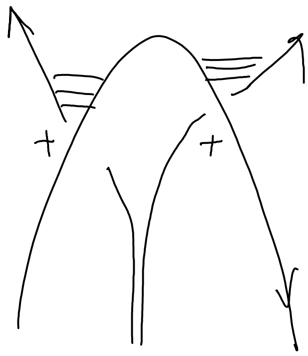
$\underbrace{1}\underbrace{32}\underbrace{54}$ R2



"The Fibonahedron"



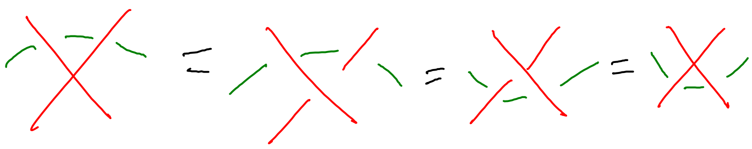




<u>Question</u> Is (r/g v-tangles) = (homotopy 2-tangles)?

$\Rightarrow$ No. Modulo the latter, 6T collapses to "everything (on 2 strands) commutes".

Topologically:



so "crossings commute".