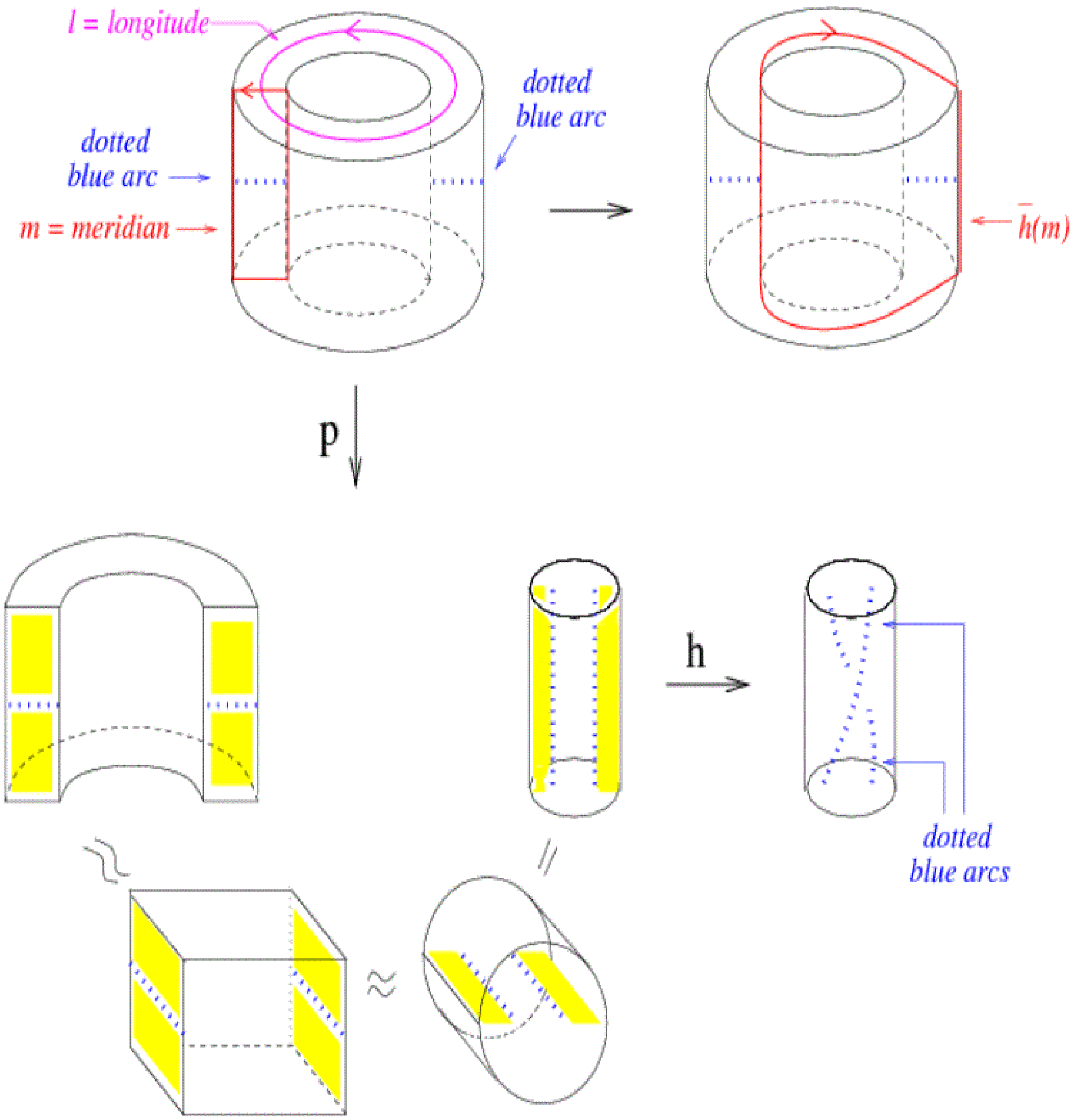
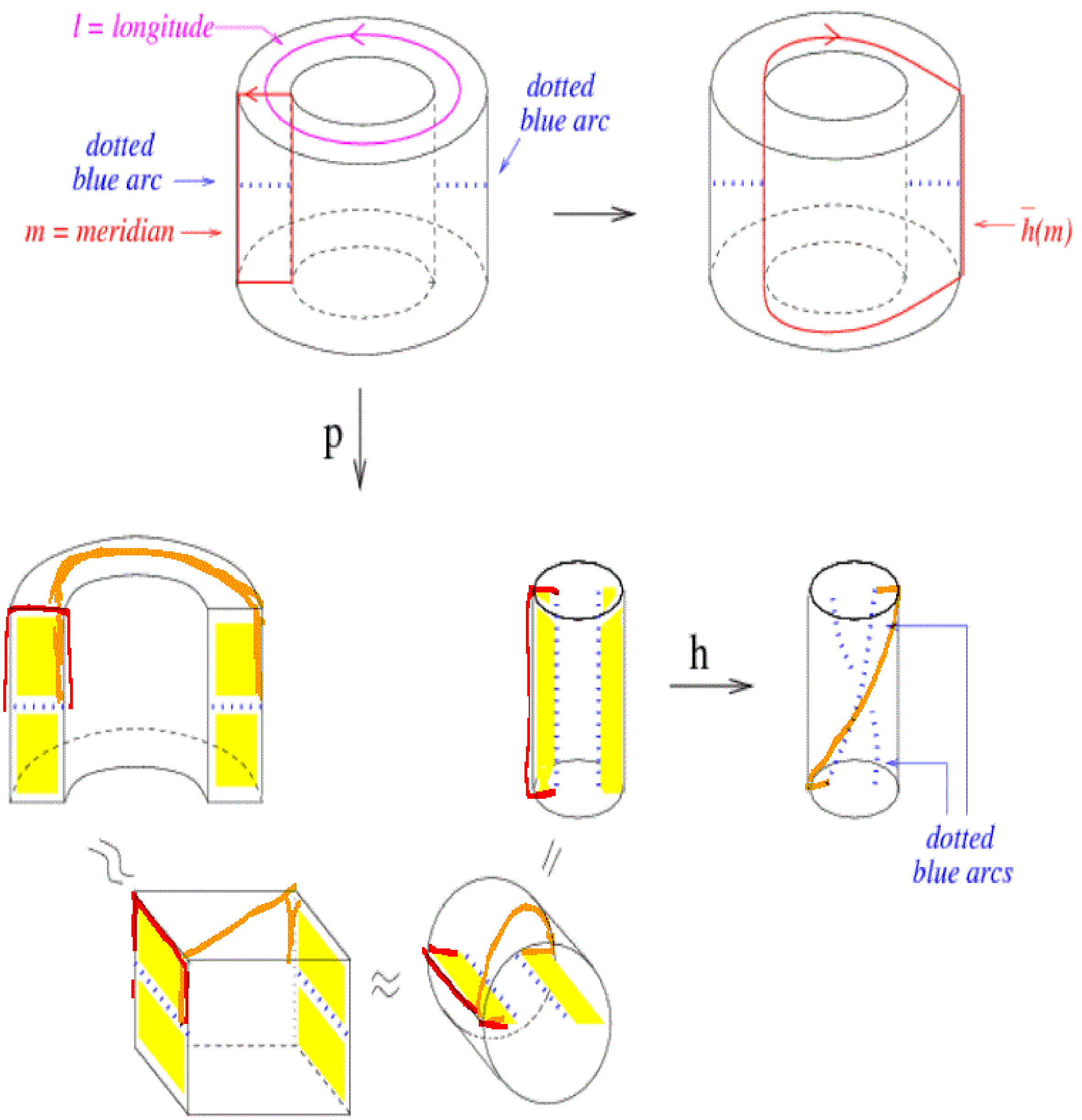
Feb 23

Note Title 2/22/2010

Review :



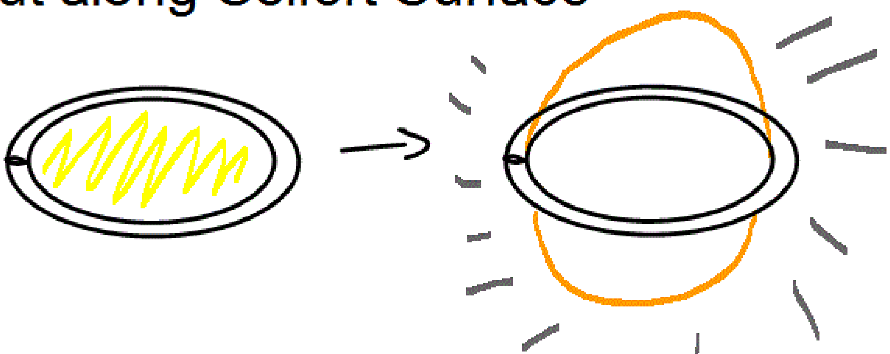
Looking at M - V w/a focus on $\partial(M - V) = \partial V$



Tangle method for finding double cover

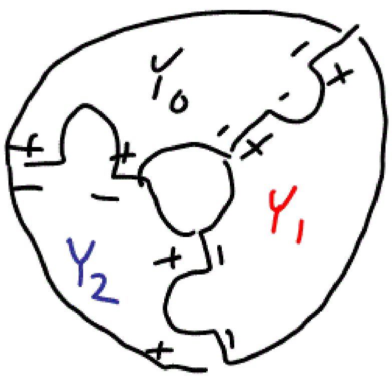
$\widetilde{(S^3 \setminus O_1)}_3$ = 3-fold cyclic cover of $S^3 \setminus O_1$

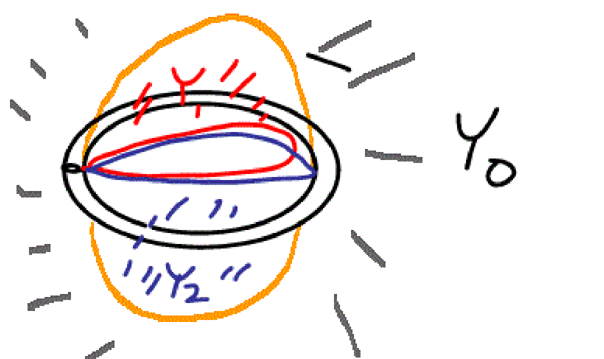
1.) cut along Seifert Surface



$S^3 \setminus B^3 = B^3$

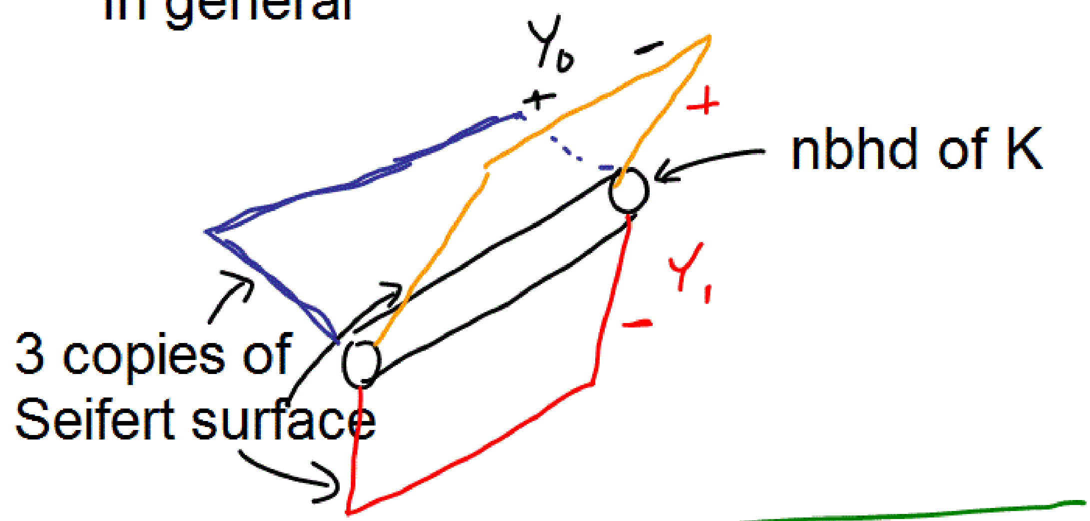
2.) glue together 3 copies





$S^3 \setminus O_1 = (S^1 \times D^2)^\circ$

In general

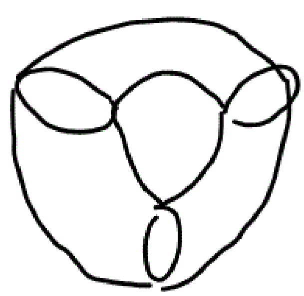


Alternate method

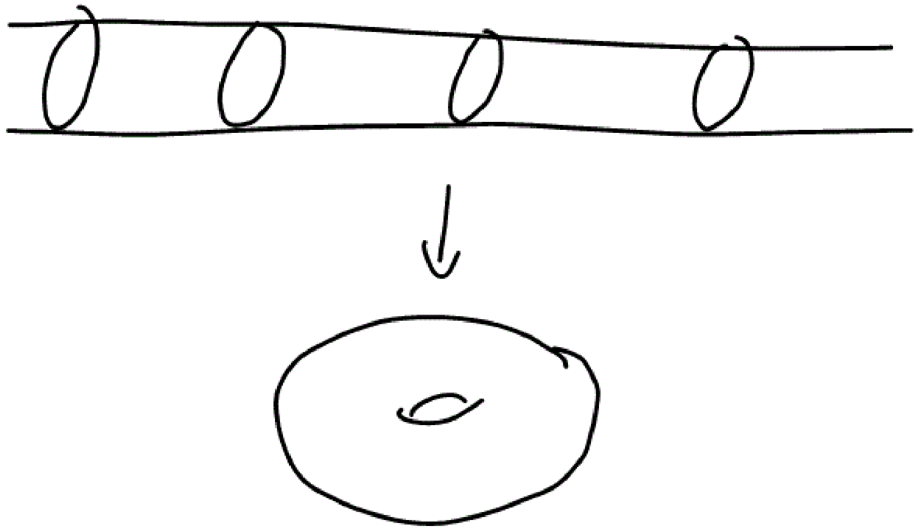
Note $S^3 \setminus O_1 = (S^1 \times D^2)^0$

$=$ 

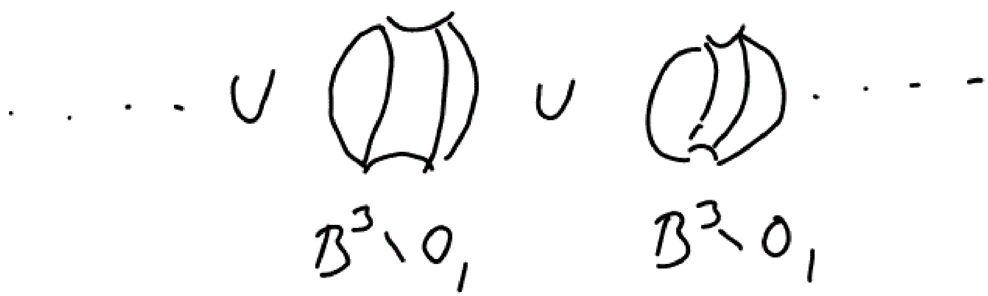
Triple cover of 

$=$  $= (S^1 \times D^2)^0$

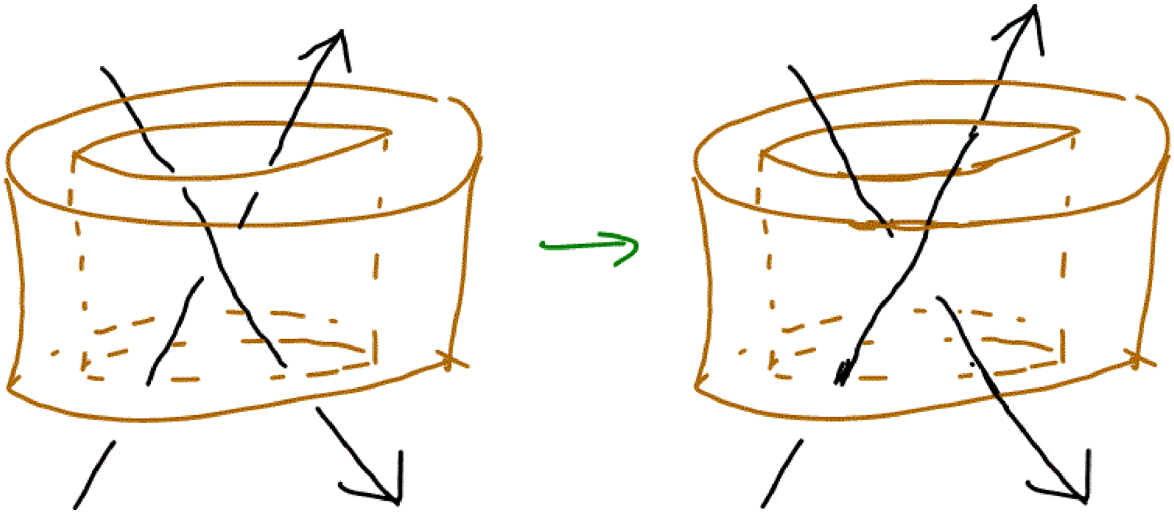
Infinite cyclic cover of S^3 - unknot



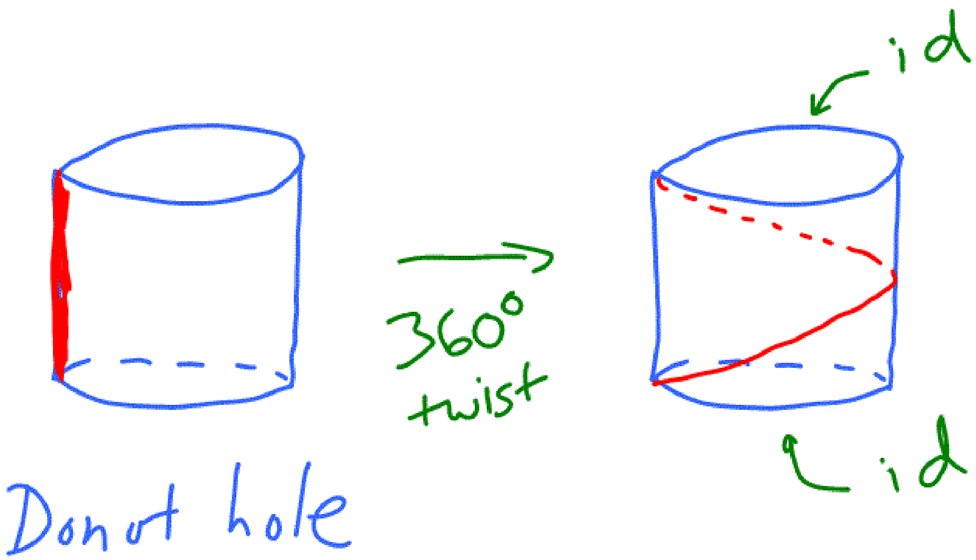
first method

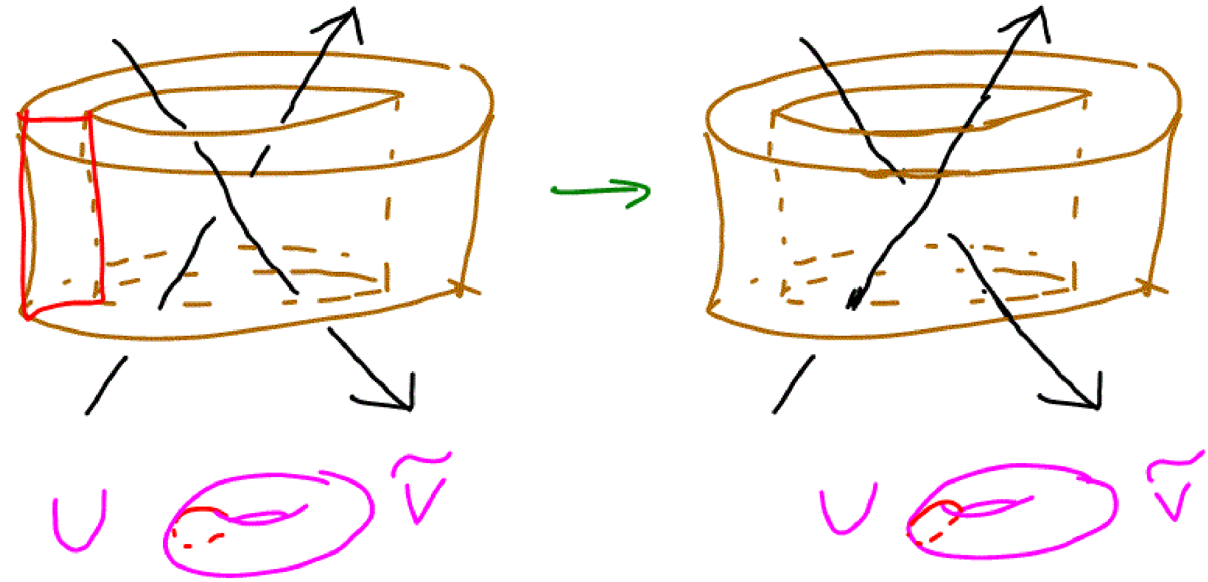


Section 6C



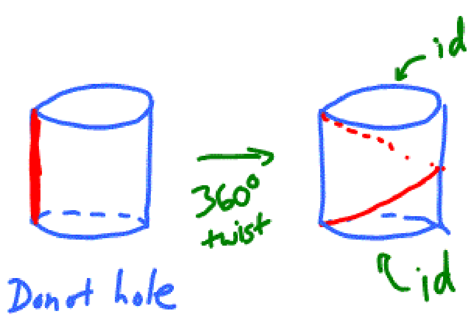
$$S^3 \setminus V \cong S^3 \setminus V$$





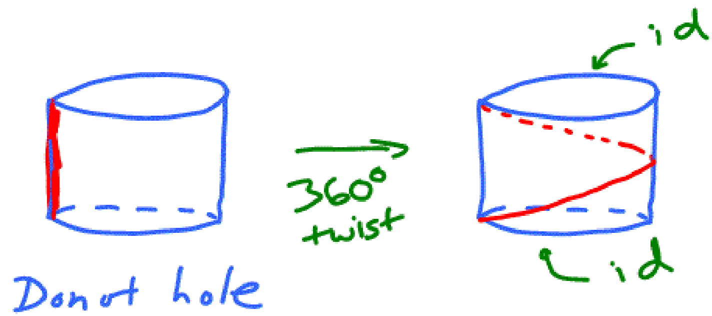
$$S^3 = (S^3 \setminus V) \underset{\tilde{m} \to ?}{\cup} \tilde{V} \cong (S^3 \setminus V) \underset{\tilde{m} \to ?}{\cup} \tilde{V}$$

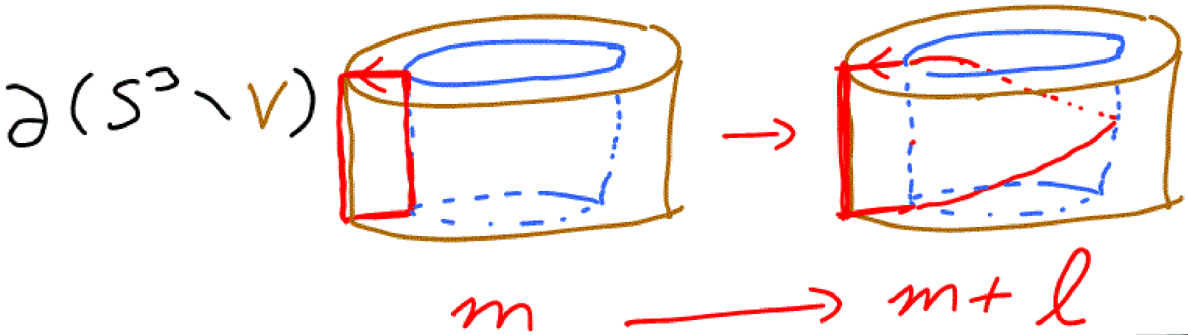
since

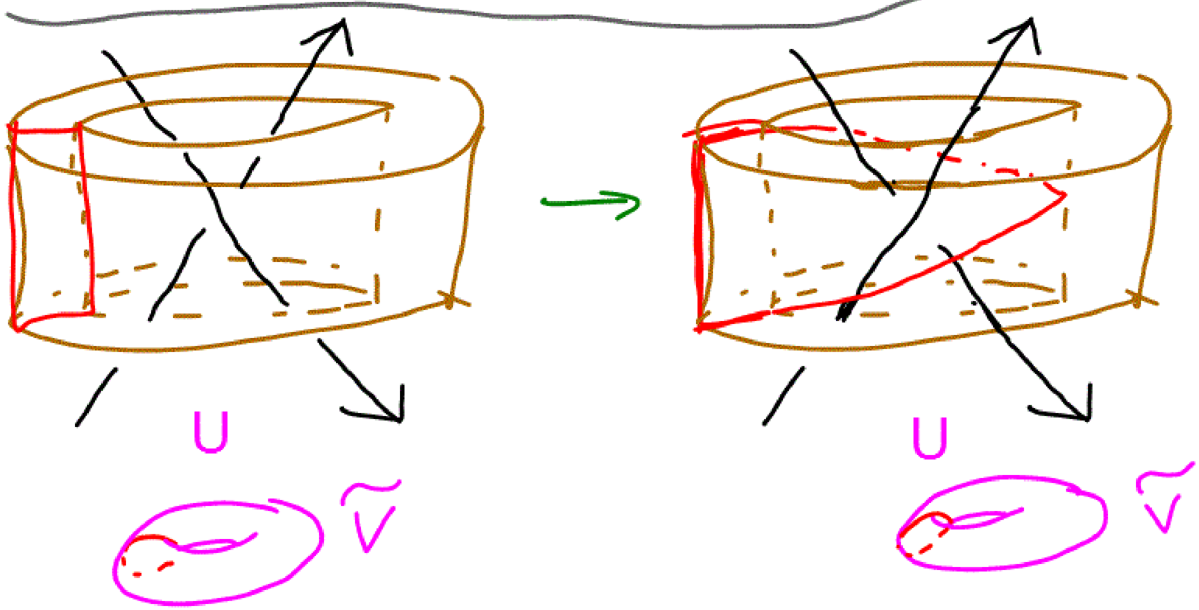


$$S^3 \setminus V \underset{\text{twist donut hole } 360^\circ}{\cong} S^3 \setminus V$$

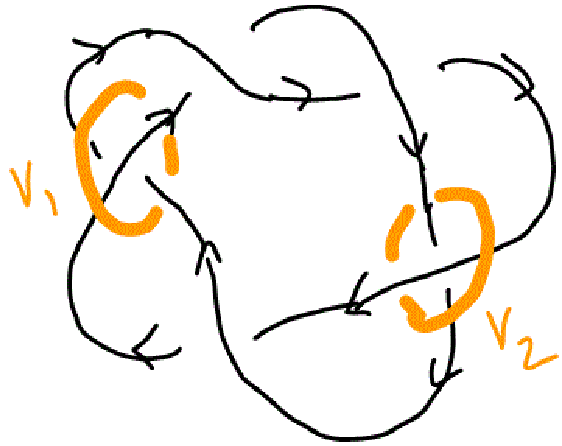
$$\tilde{V} \underset{\substack{id \\ \tilde{m} \to \tilde{m}}}{\cong} \tilde{V}$$

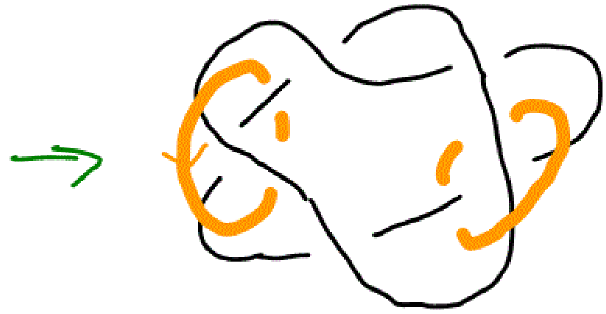






$$S^3 = (S^3 \setminus V) \cup_{\tilde{m} \to m} \tilde{V} \cong (S^3 \setminus V) \cup_{\tilde{m} \to m+\ell} \tilde{V}$$

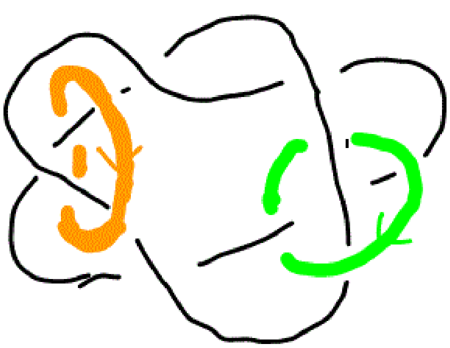


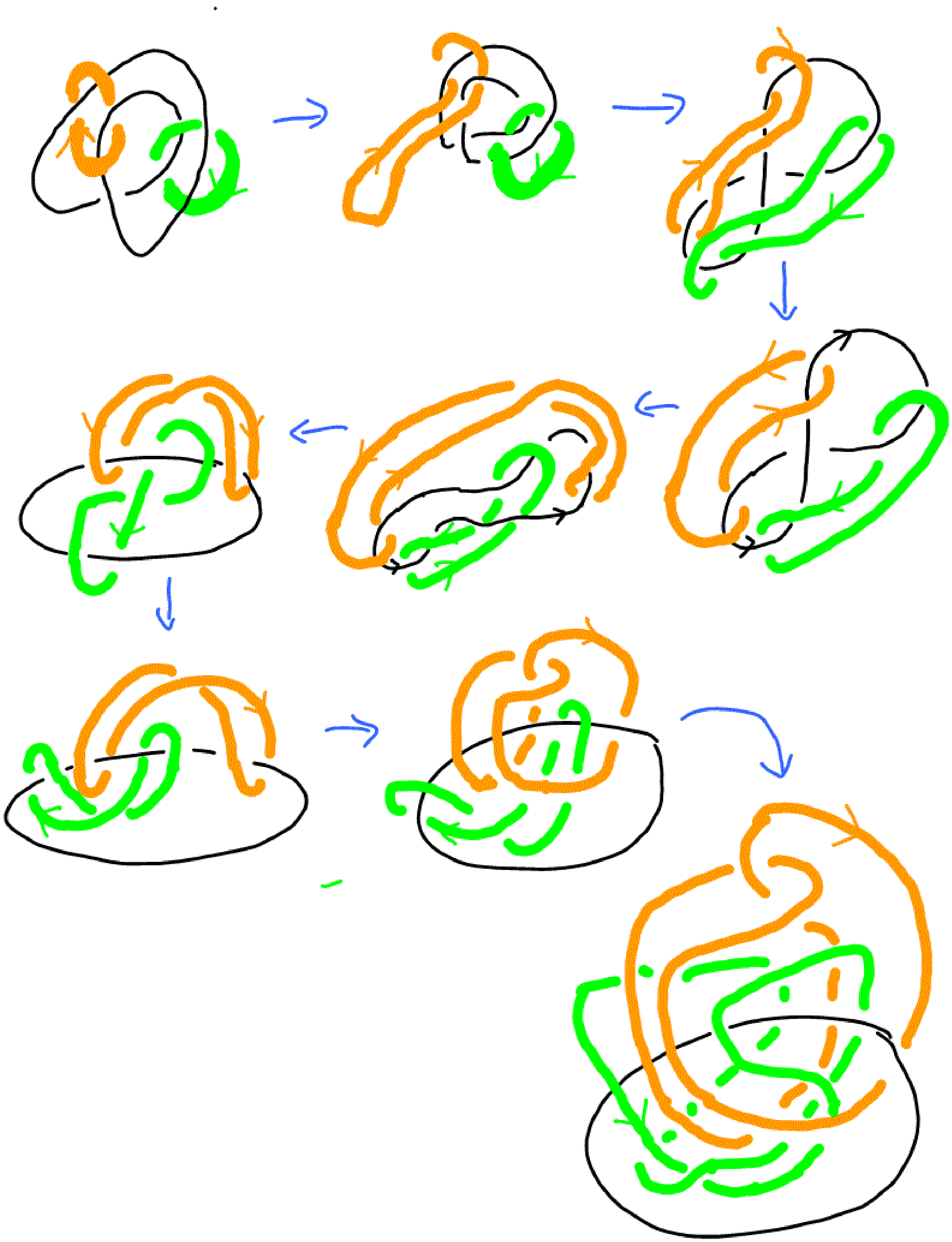


$$(S^3 \setminus S_1) \setminus (V_1 \cup V_2) \cong (S^3 \setminus O_1) \setminus (V_1 \cup V_2)$$

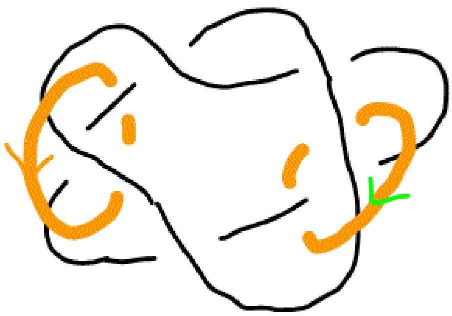
$\cup \tilde{V}_1 \cup \tilde{V}_2$ $\cup \tilde{V}_1 \cup \tilde{V}_2$

$\tilde{m} \to m$, $\tilde{m} \to m$ $\tilde{m} \to m+\ell$, $\tilde{m} \to m+\ell$





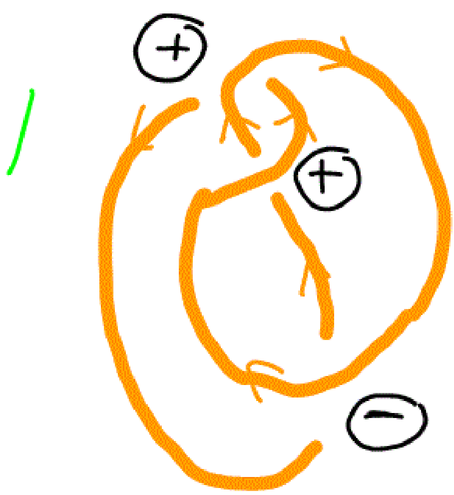

$\tilde{V}_{11}$, $\tilde{V}_{12}$
$\tilde{V}_{21}$ $\tilde{V}_{22}$
double cover
$\tilde{V}_2 \cup \tilde{V}_1 \cup$
$\tilde{m}_i \to m_i + l_i$



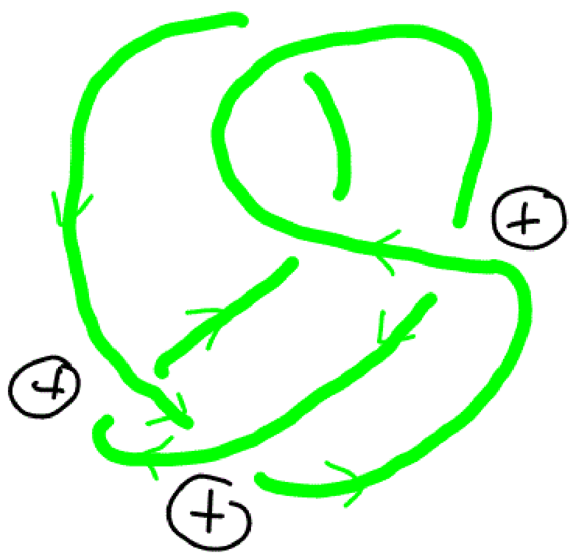
$(S^3 \setminus O_1) \setminus (V_1 \cup V_2)$

$\cup \tilde{V}_1 \cup \tilde{V}_2$

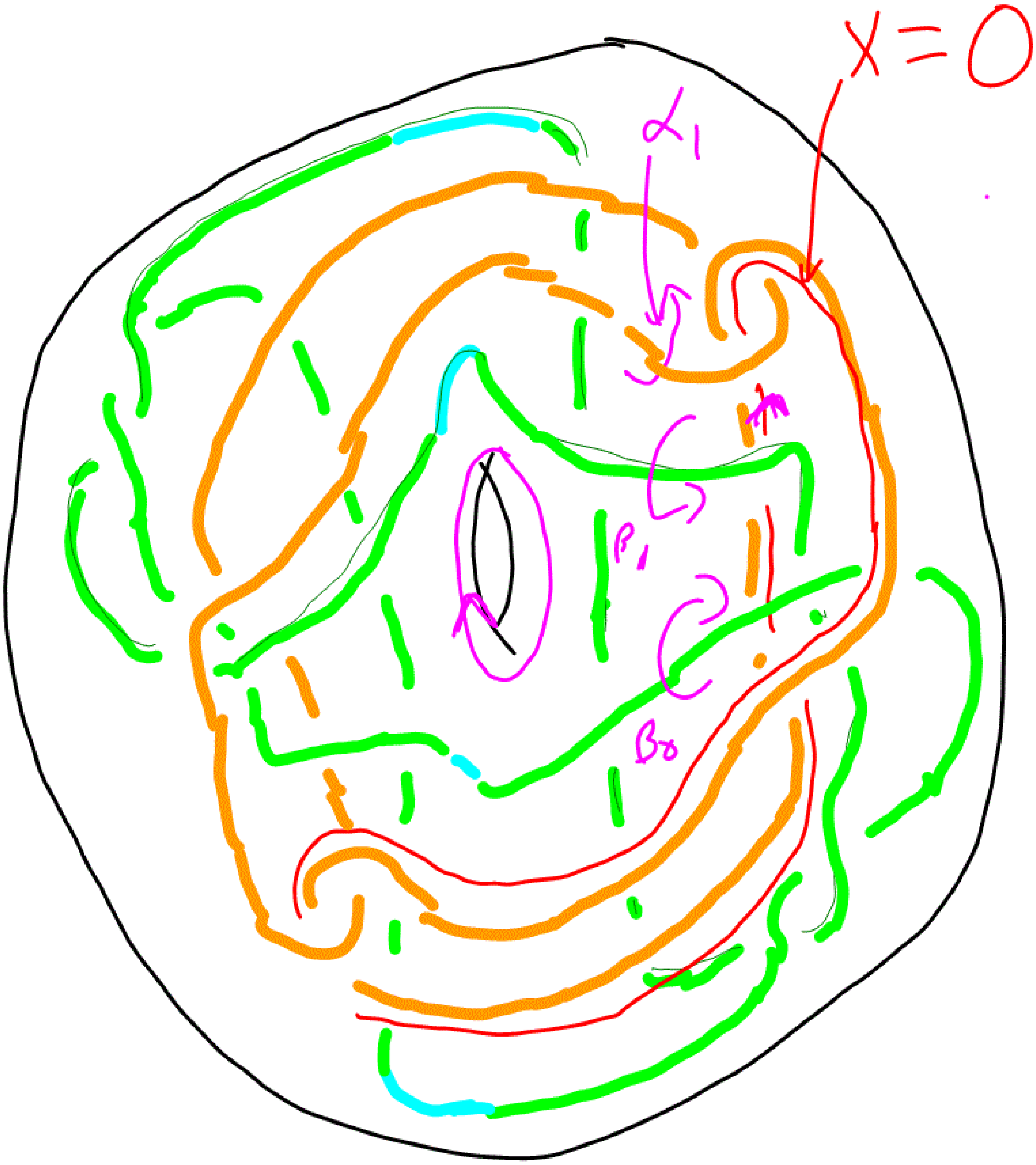
$\tilde{m} \to m + l$ $\tilde{m} \to m + l$



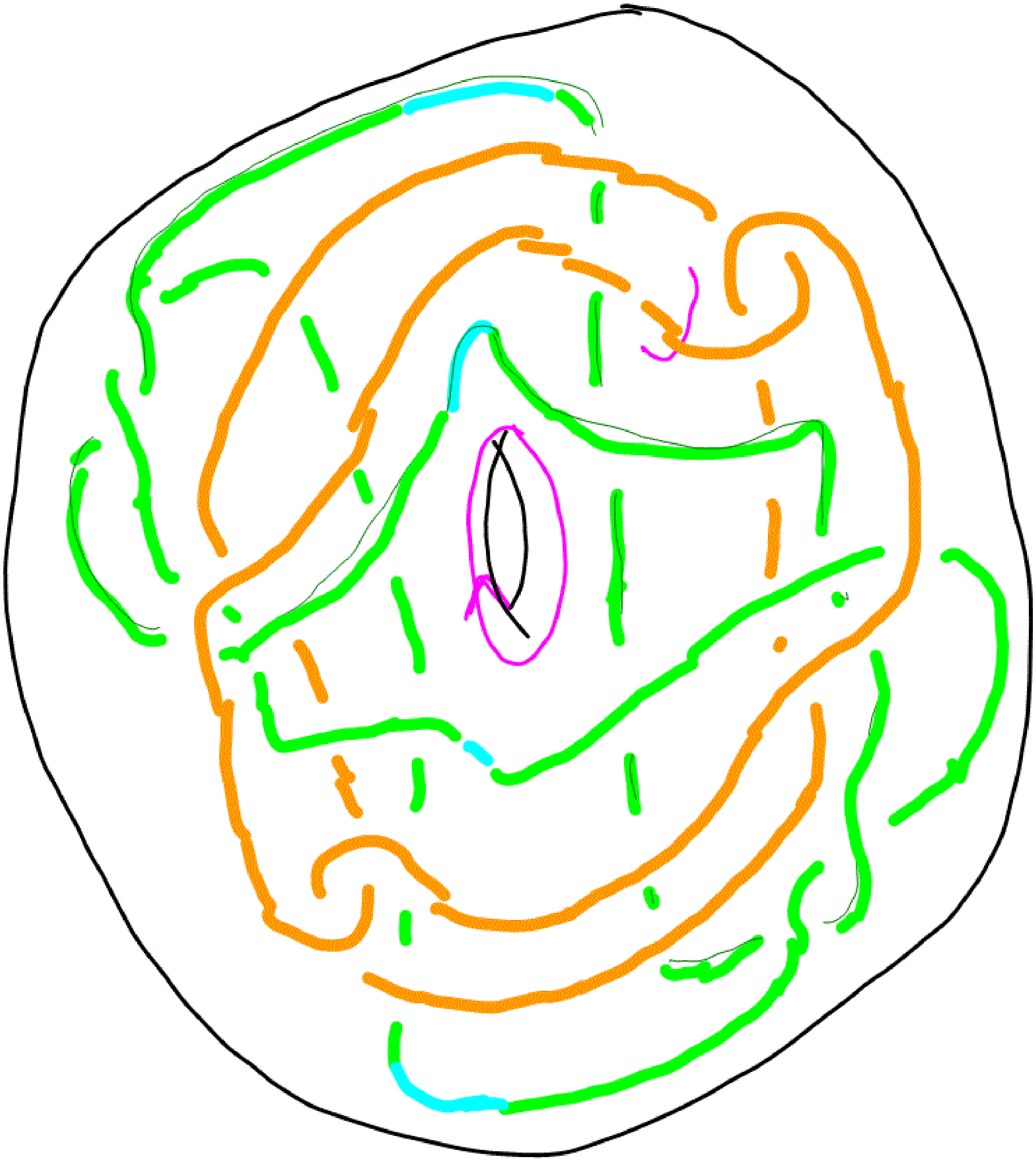
Wr = +1

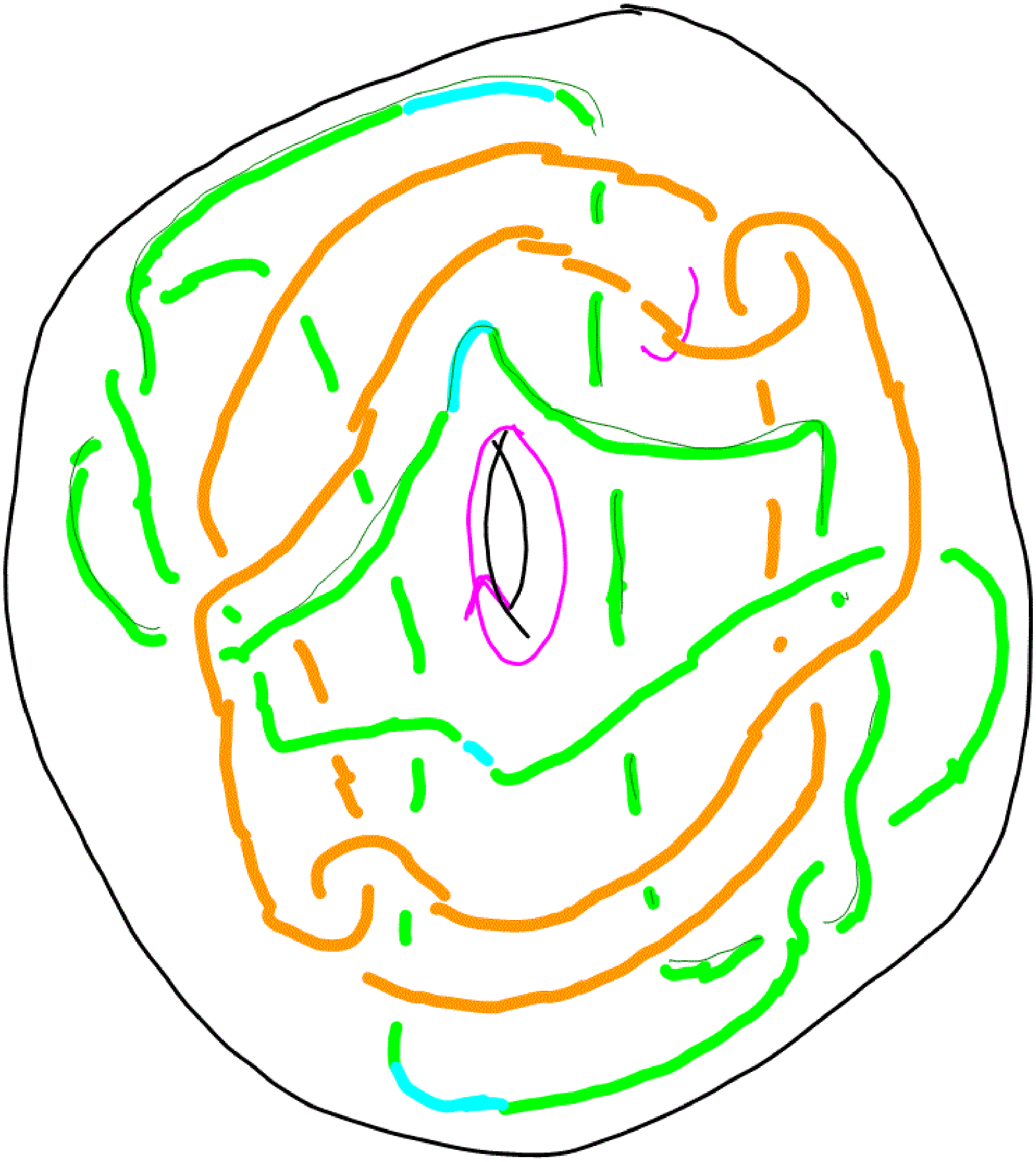


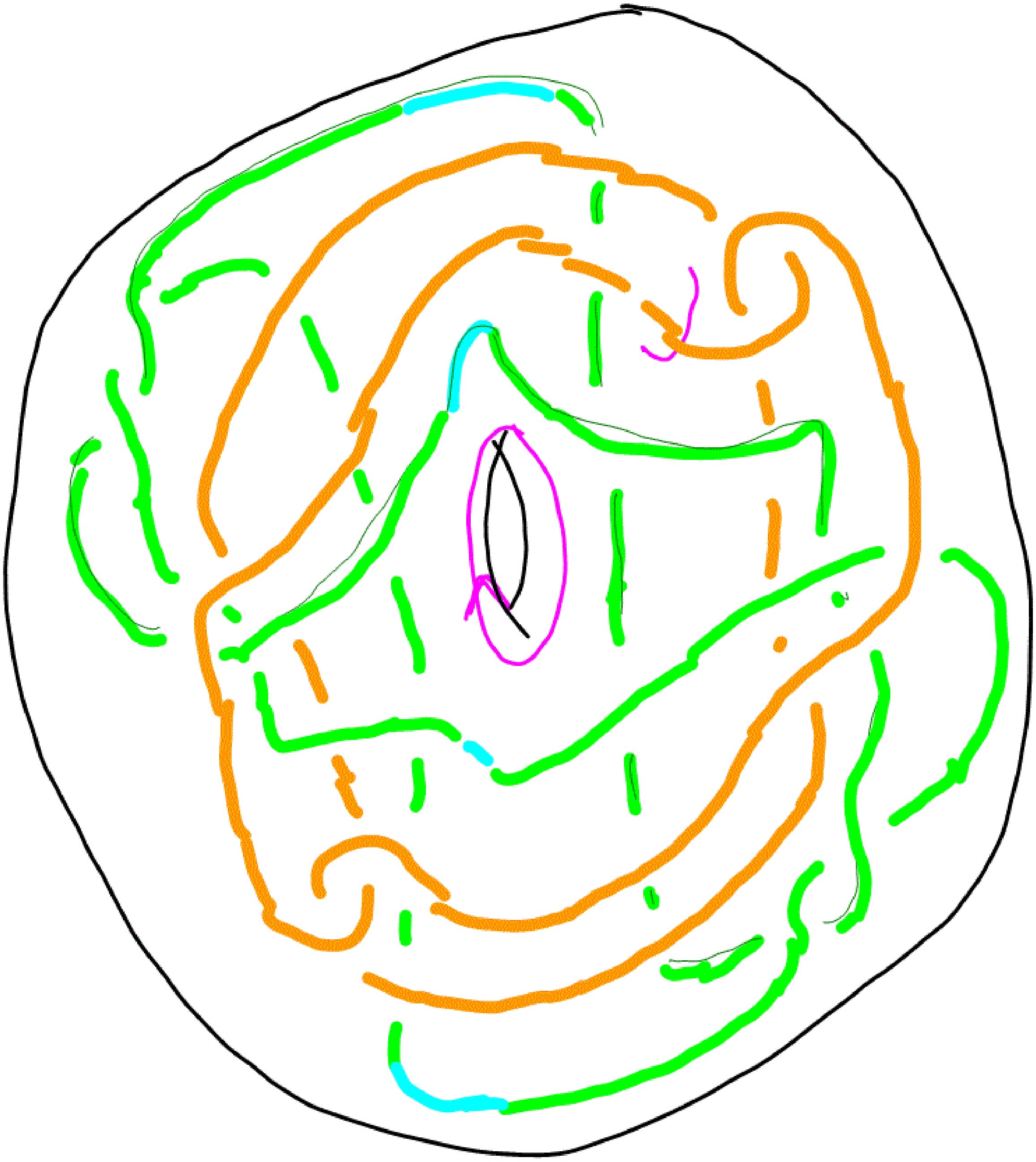

α_1
β_1
γ
α_0

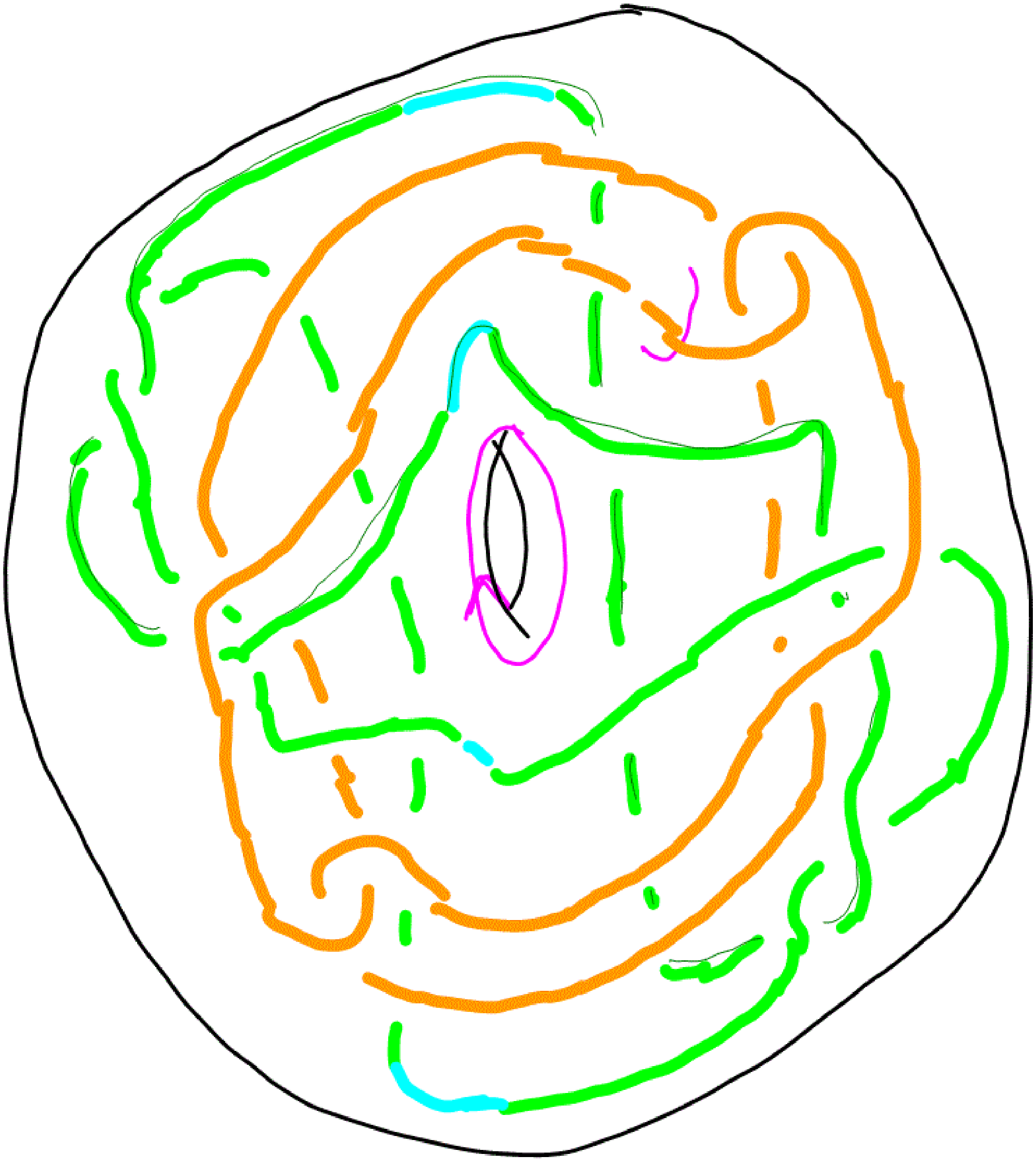


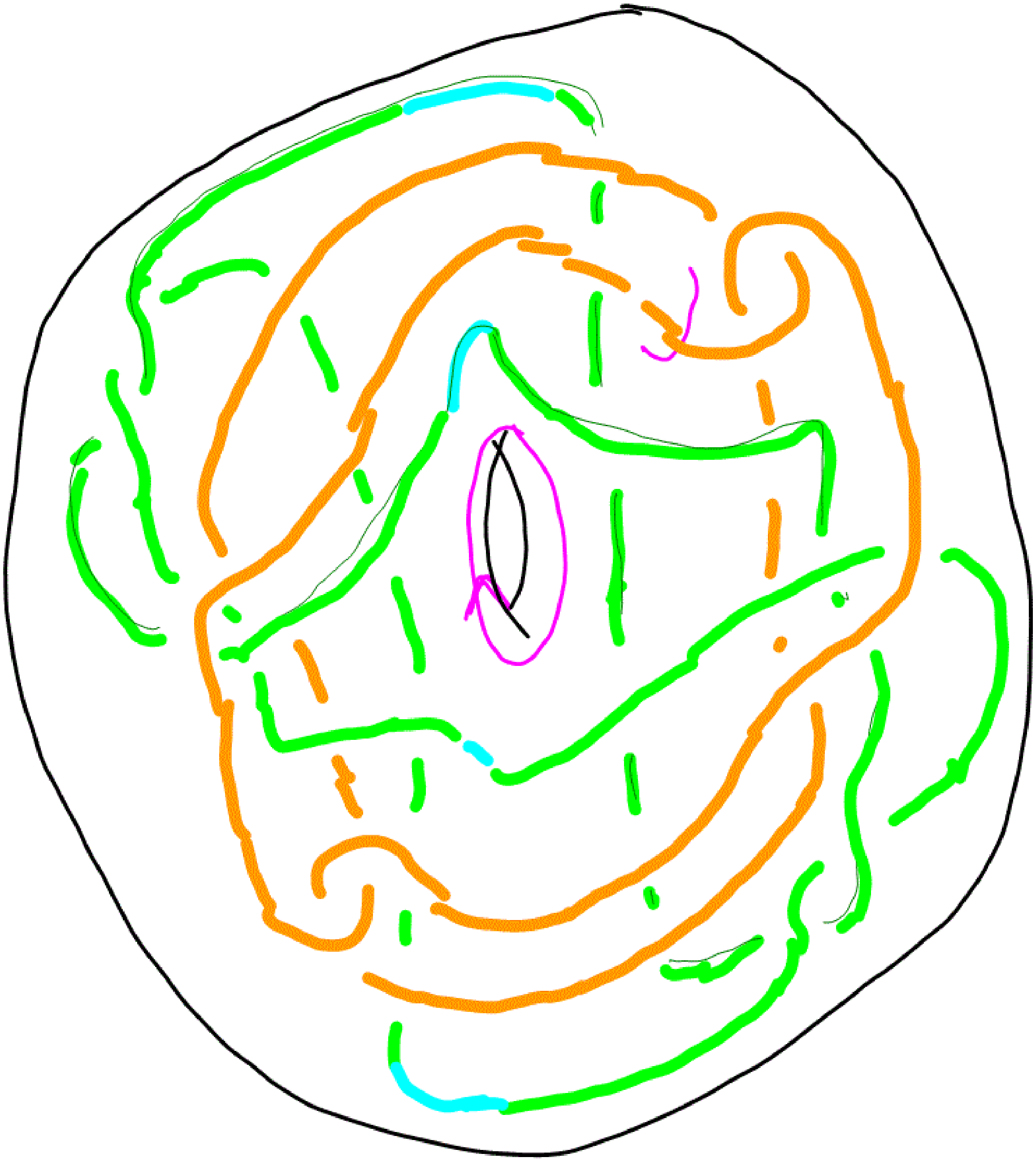
$$X + \alpha_1 - \beta_1 + \beta_0 = 0$$

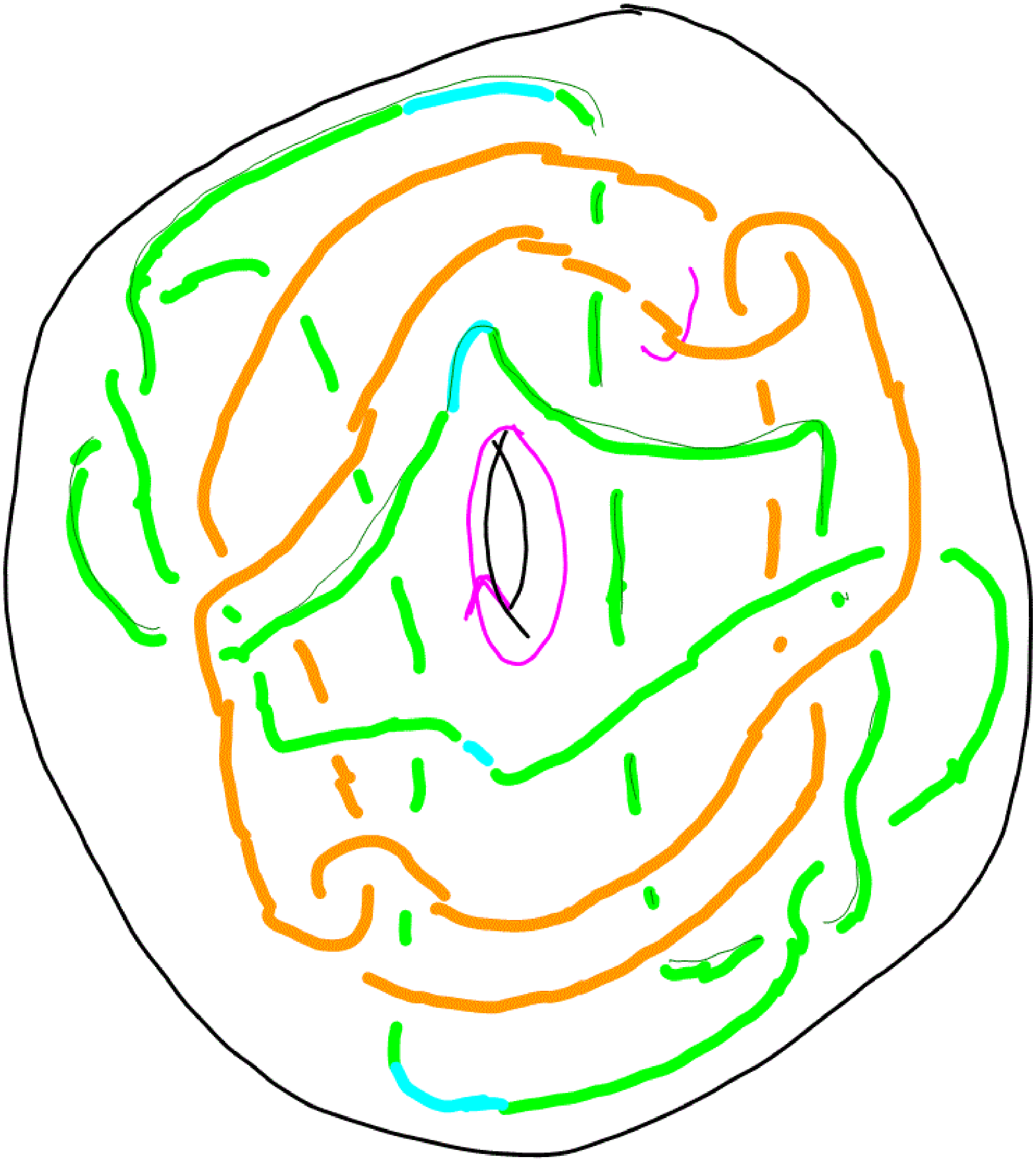




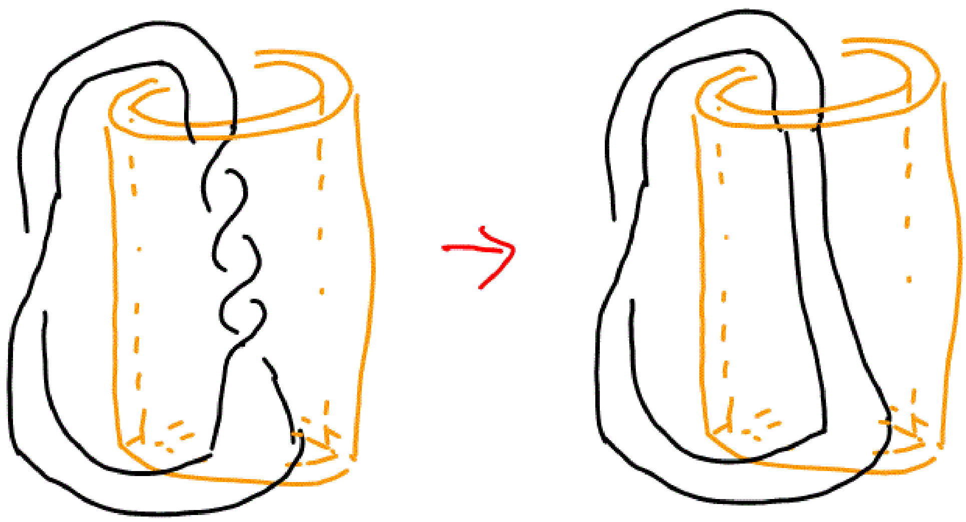








6D Surgery Description of Knots



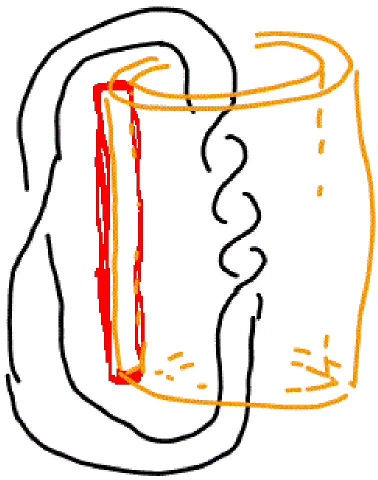
$$(S^3 \setminus V) \cup_{\tilde{m} \to ?} \tilde{V} \cong (S^3 \setminus V) \cup_{\tilde{m} \to ?} \tilde{V}$$

since

$$S^3 \setminus V \underset{\text{twist donut hole } 720^\circ}{\cong} S^3 \setminus V$$

$$\tilde{V} \underset{\text{id}}{\cong} \tilde{V}$$

$\tilde{m} \to \tilde{m}$



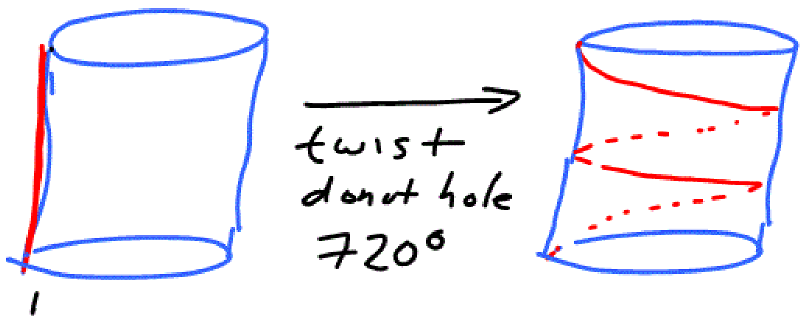
$$(S^3 \setminus V) \cup \tilde{V}$$

$$\tilde{m} \to m$$

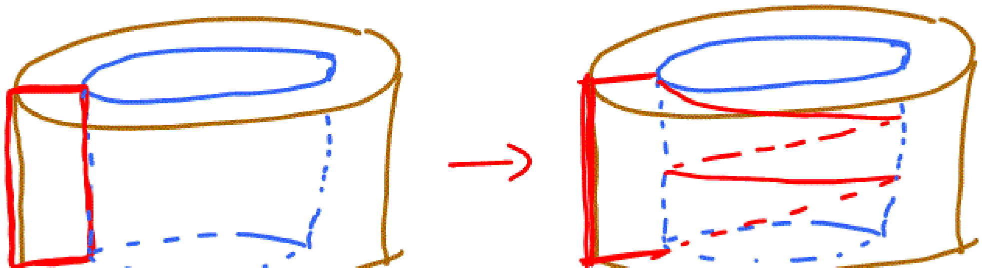
$$\tilde{V} \underset{id}{\cong} \tilde{V}$$

$$\tilde{m} \to \tilde{m}$$

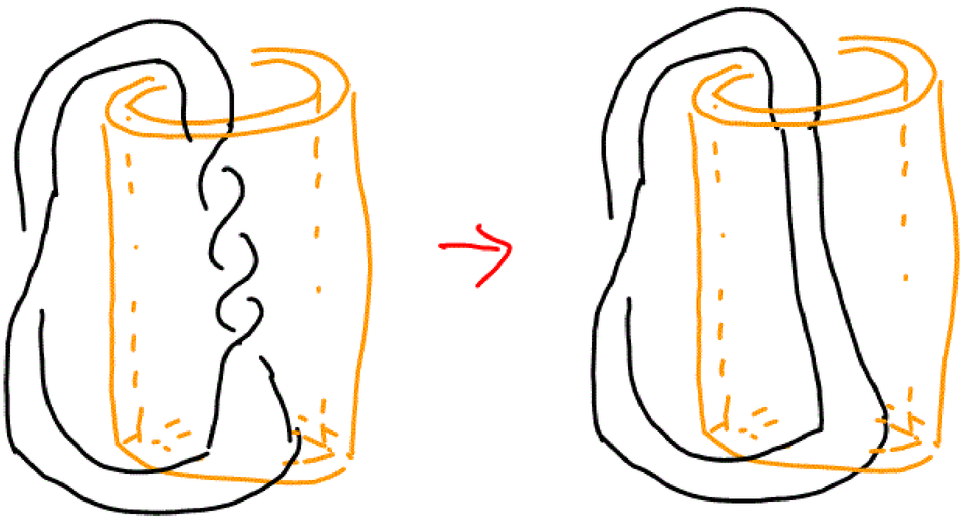
Donut hole



$$\partial(S^3 \setminus V)$$



$$m \longrightarrow m + 2\ell$$

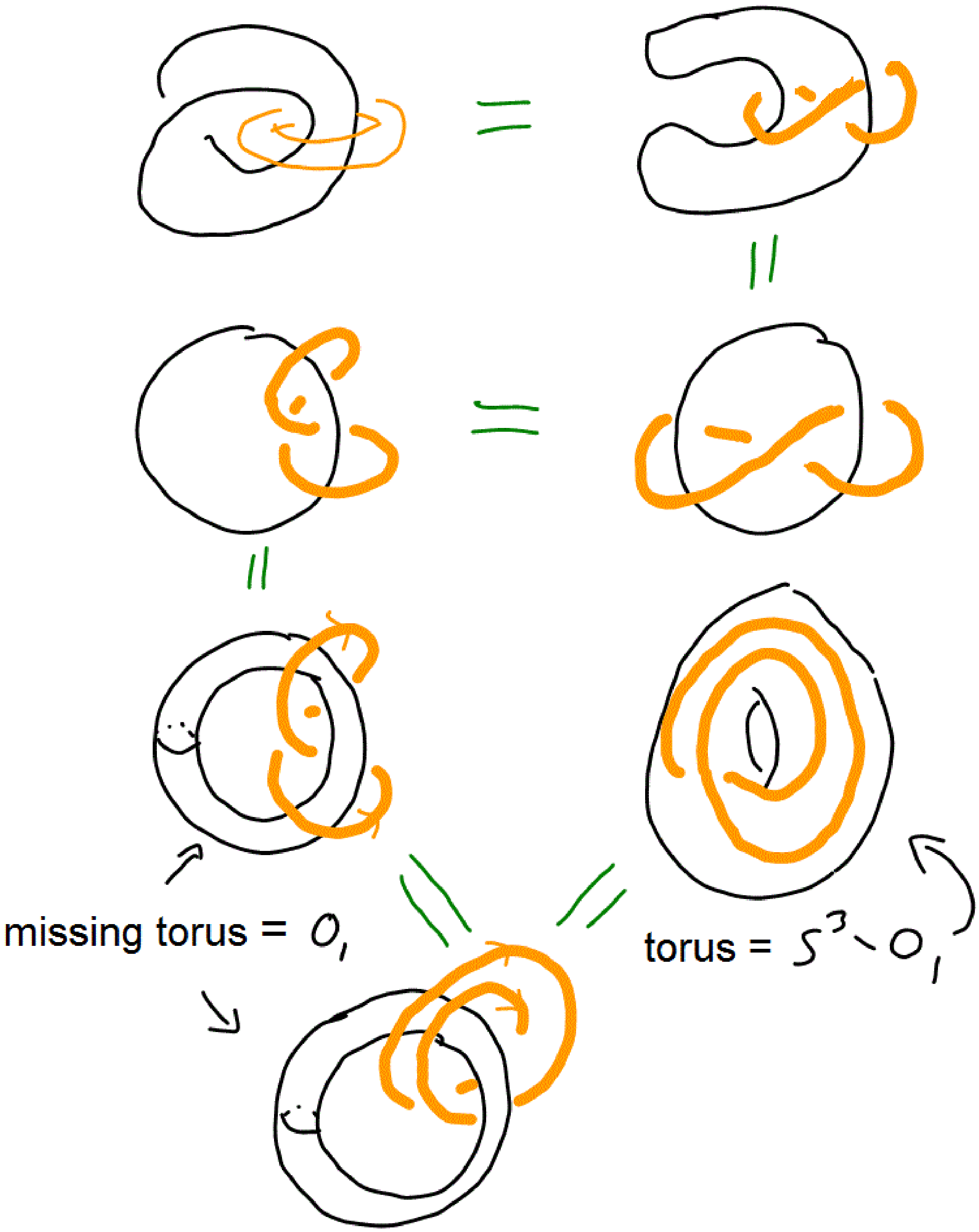


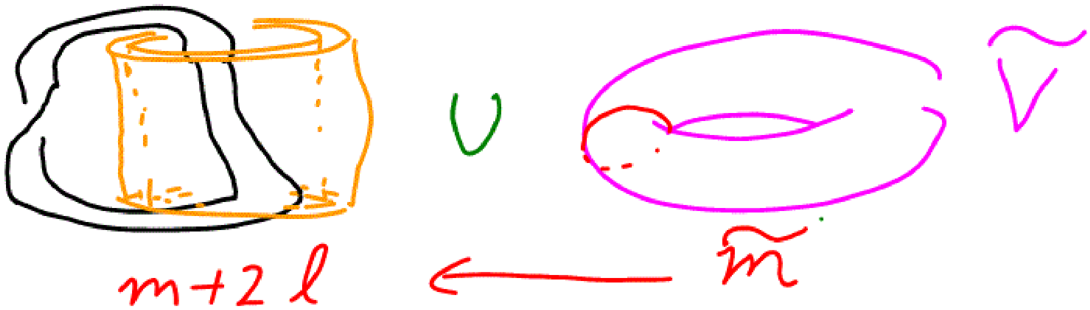
$$(S^3 \setminus V) \cup_{\tilde{m} \to m} \tilde{V} \cong (S^3 \setminus V) \cup_{\tilde{m} \to m+2l} \tilde{V}$$

$$S^3 \setminus S_1 = \left[(S^3 \setminus S_1) \setminus V\right] \cup_{\tilde{m} \to m} \tilde{V}$$

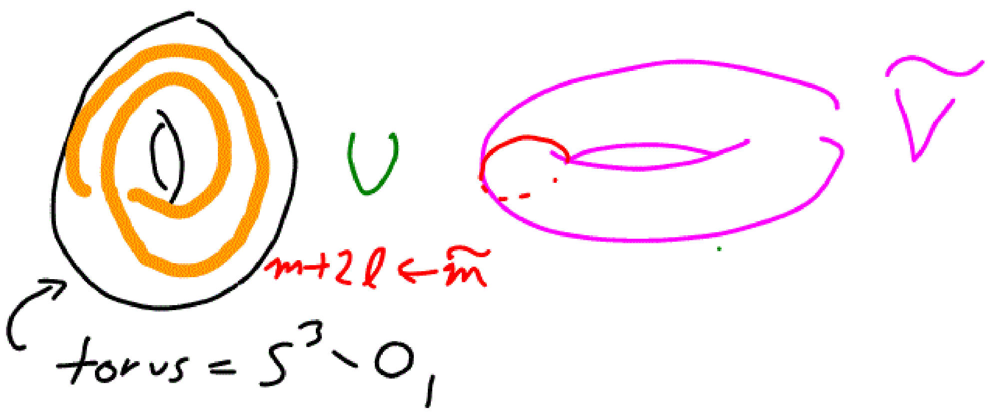
$$= \left[(S^3 \setminus O_1) \setminus V\right] \cup_{\tilde{m} \to m+2l} \tilde{V}$$

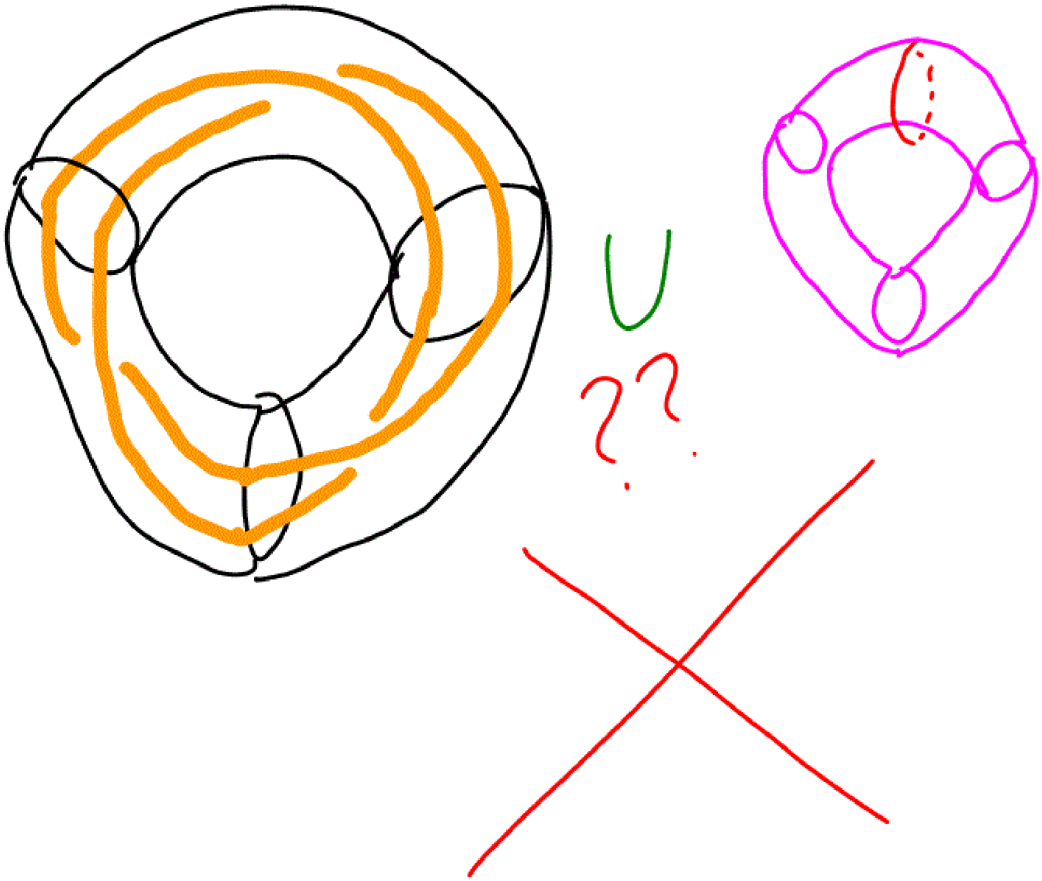
$$= [\,\text{torus} \setminus V\,] \cup \hat{V}$$

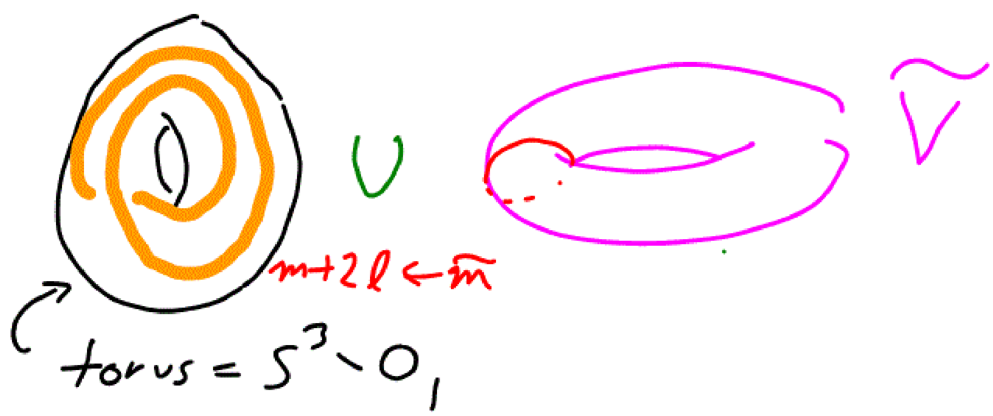

missing torus = O_1
torus = $S^3 \setminus O_1$



$$S^3 \setminus S_1 = \left[(S^3 \setminus O_1) \setminus V \right] \cup_{\tilde m \to m+2\ell} \tilde V$$




∪
??


∪
m+2l ← m̃
torus = S³ ∖ O₁