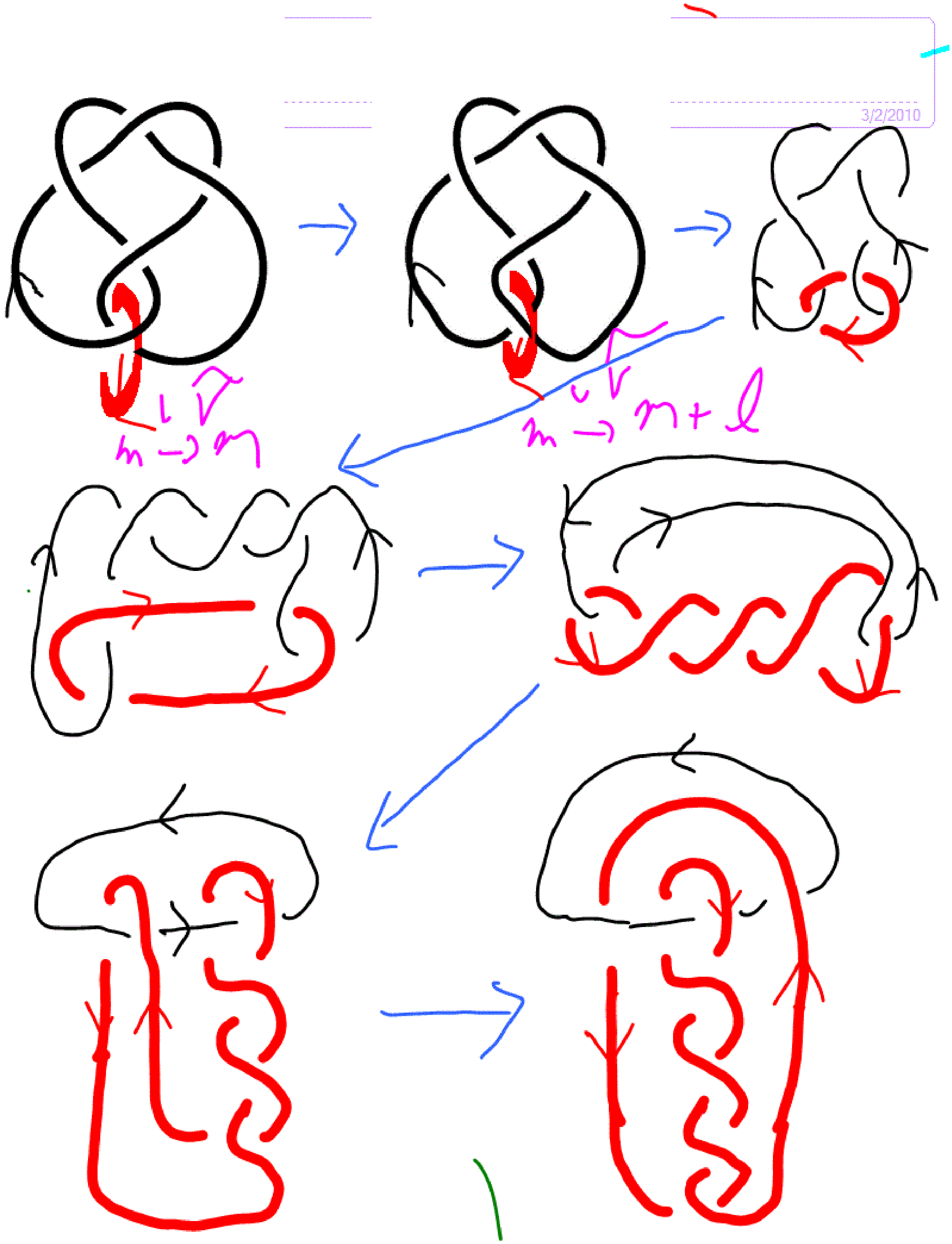
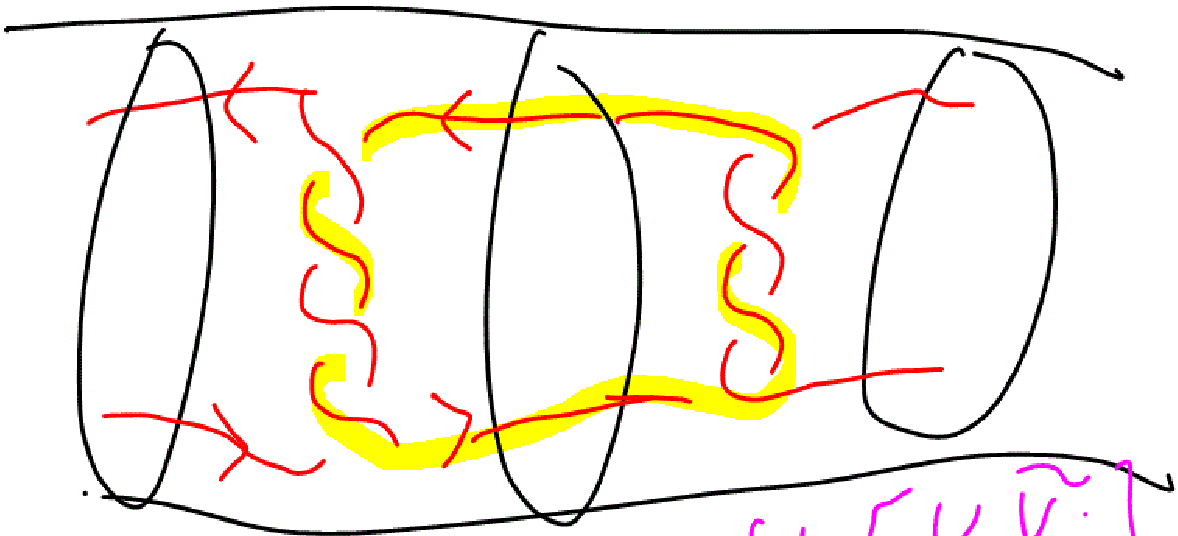
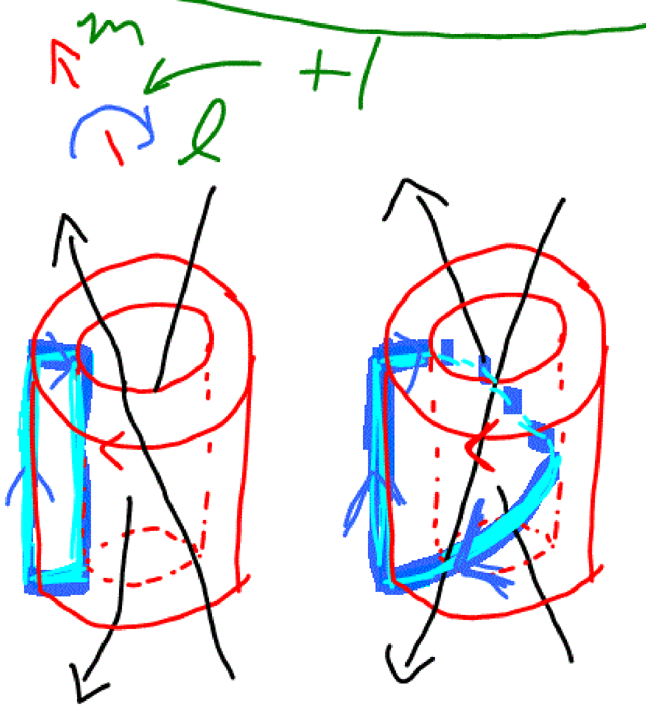
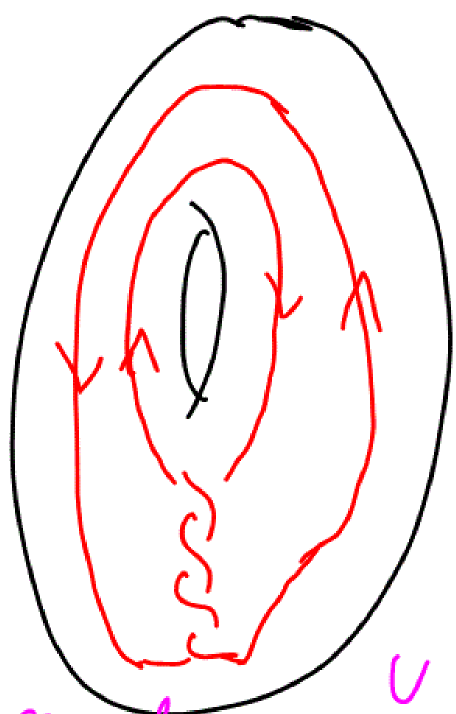

3/2/2010
m → m
m → m + l



$\cup\ [\bigcup_{i \neq \ell} \tilde{V}_i]$



$m \to m+\ell$



$\cup\ \hat{V}$

$m+\ell \leftarrow m \to m$

Thm 7C5: Let $p(t)$ be any Laurent polynomial satisfying

(1) $p(1) = \pm 1$

(2) $p(t) = p(t^{-1})$

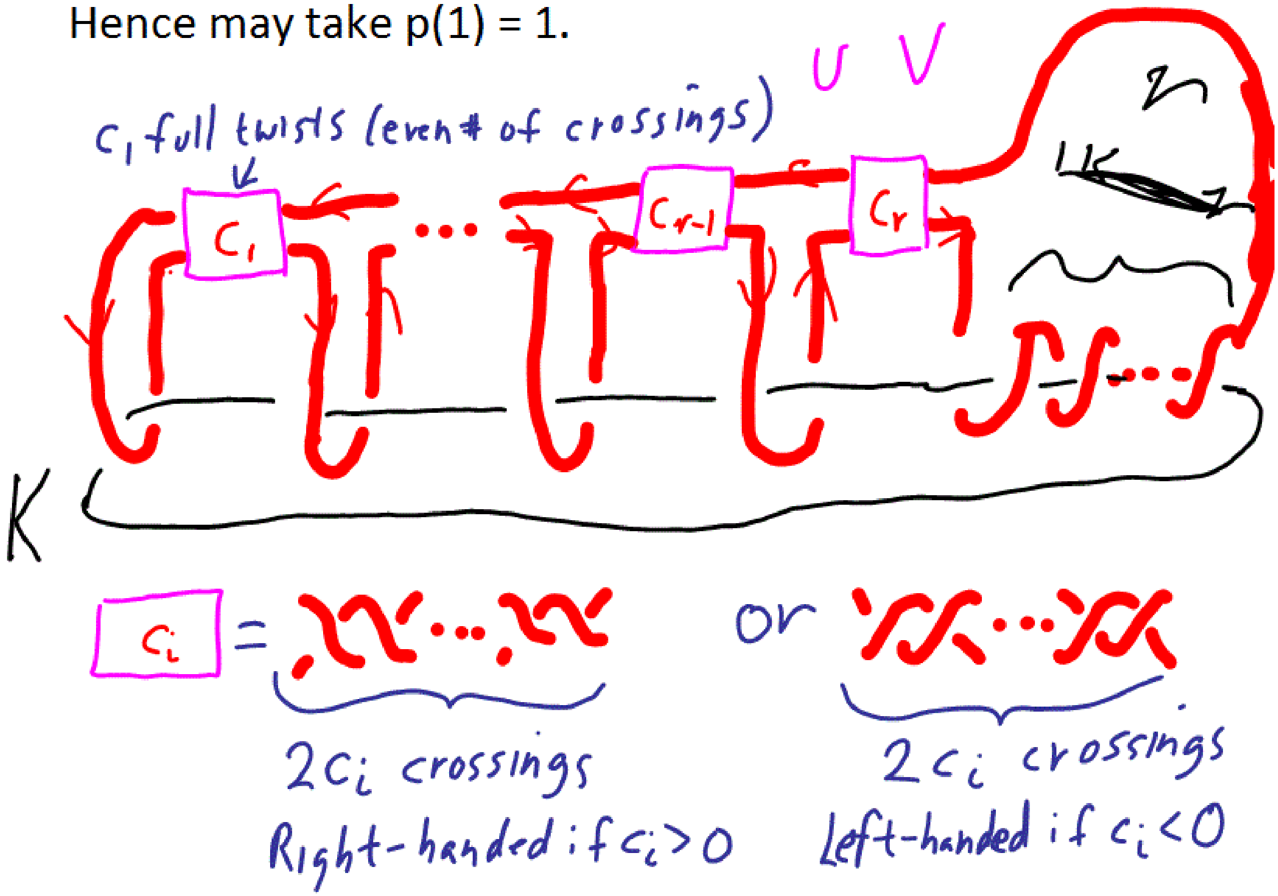
I.e., $p(t) = c_r t^{-r} + \ldots + c_1 t^{-1} + c_0 + c_1 t + \ldots + c_r t^r$

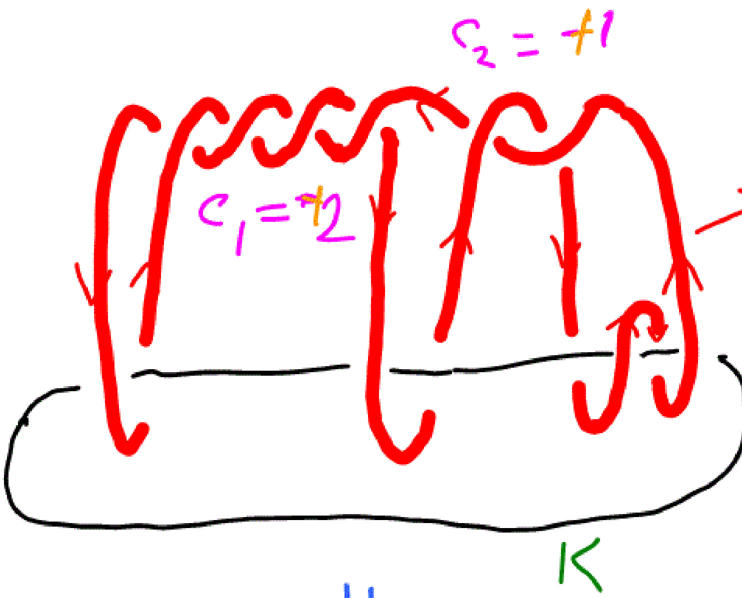
and $c_r + \ldots + c_1 + c_0 + c_1 + \ldots + c_r = \pm 1$.

Hence $c_0 = \pm 1 - 2(c_1 + \ldots + c_r)$.

Then $\exists$ Knot K w/ (Alex poly $p(t)$)

Proof: If the Alexander polynomial of a knot K is $q(t)$, then $\pm t^k q(t)$ is also an Alexander polynomial for K. Hence may take $p(1) = 1$.



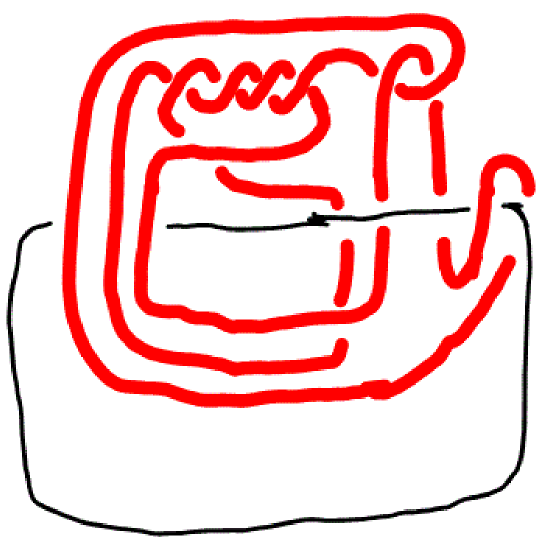


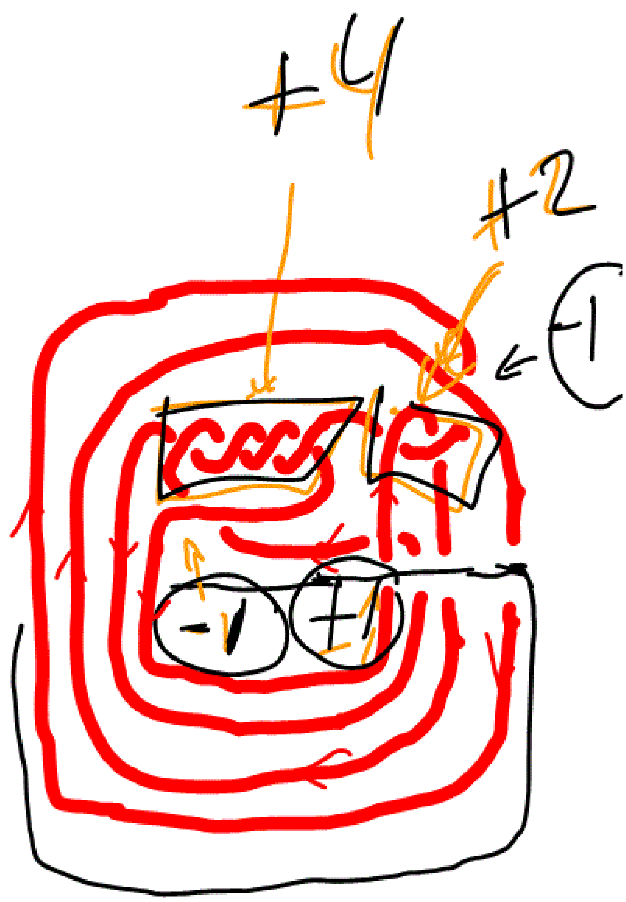
$\to \partial V \cup_h \tilde{V}$ $\quad \tilde{V} =$

$m \to m \Rightarrow$
$K = \text{unKnot}$

K=unknot
before surgery
on red torus

=

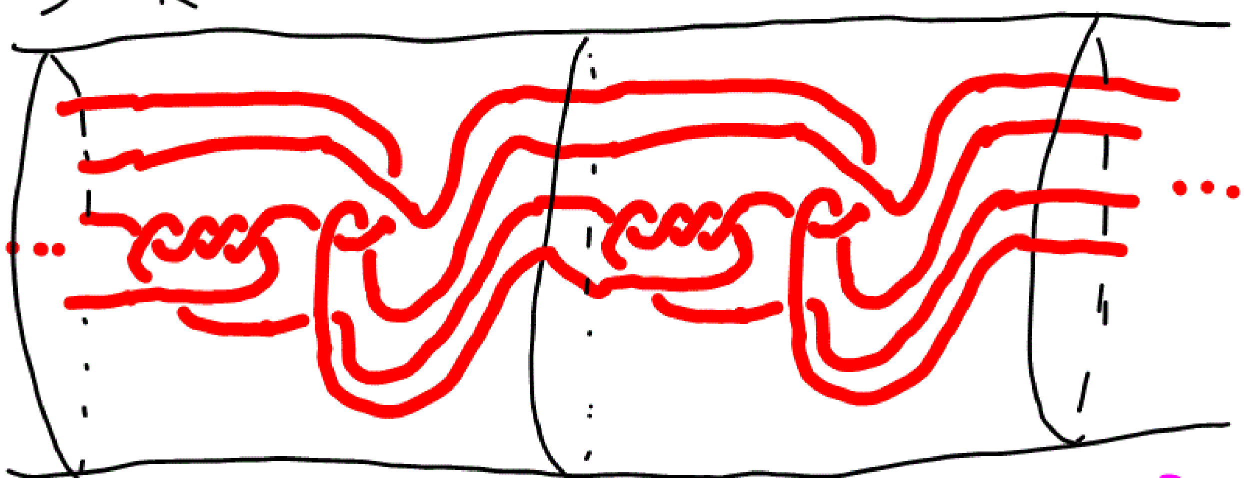




After surgery,
K = knot with
Alexander
polynomial ??

$wr = 5$

$\widetilde{S^3 \setminus K} =$



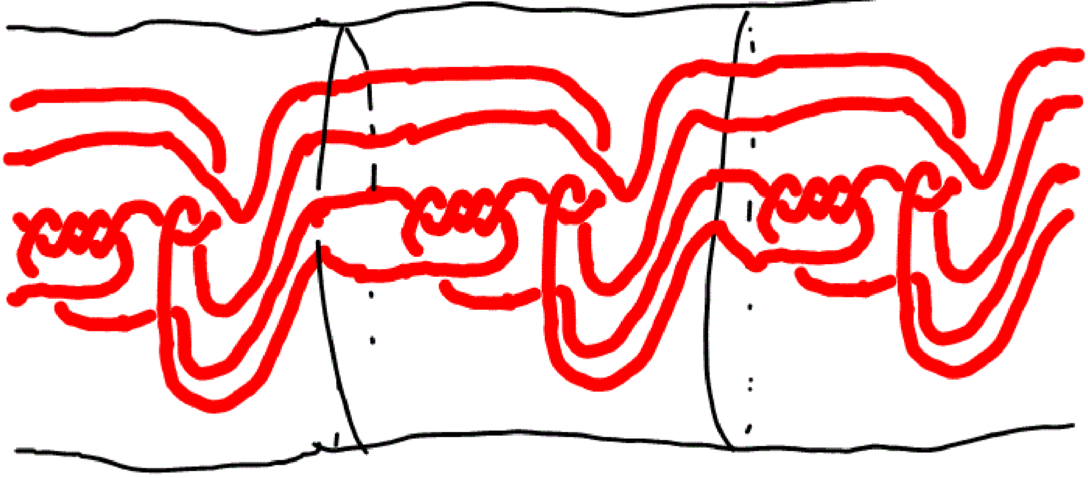
$\bigcup_n [U\tilde{V}]$

$\downarrow$

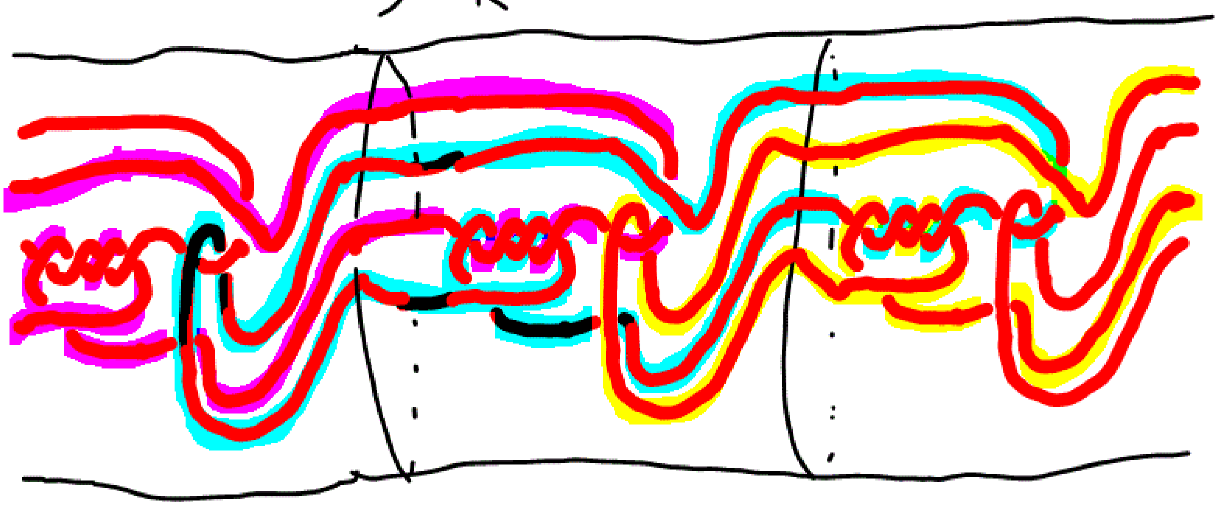
$S^3 \setminus K =$

$U\tilde{V}$

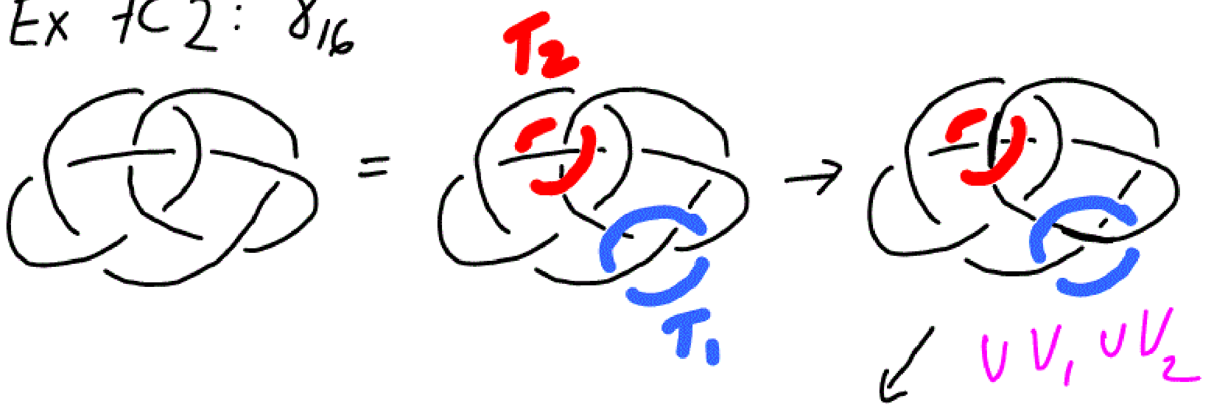
$\widetilde{S^3 \setminus K} =$

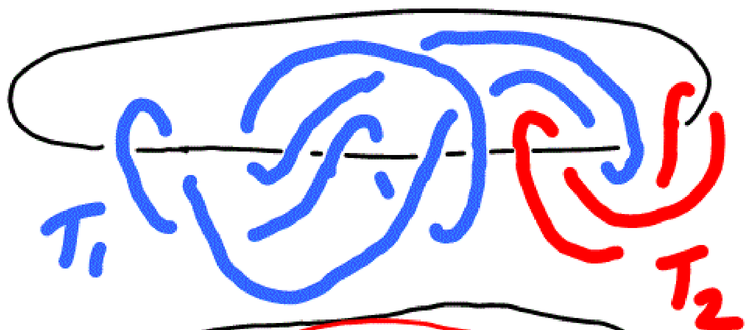


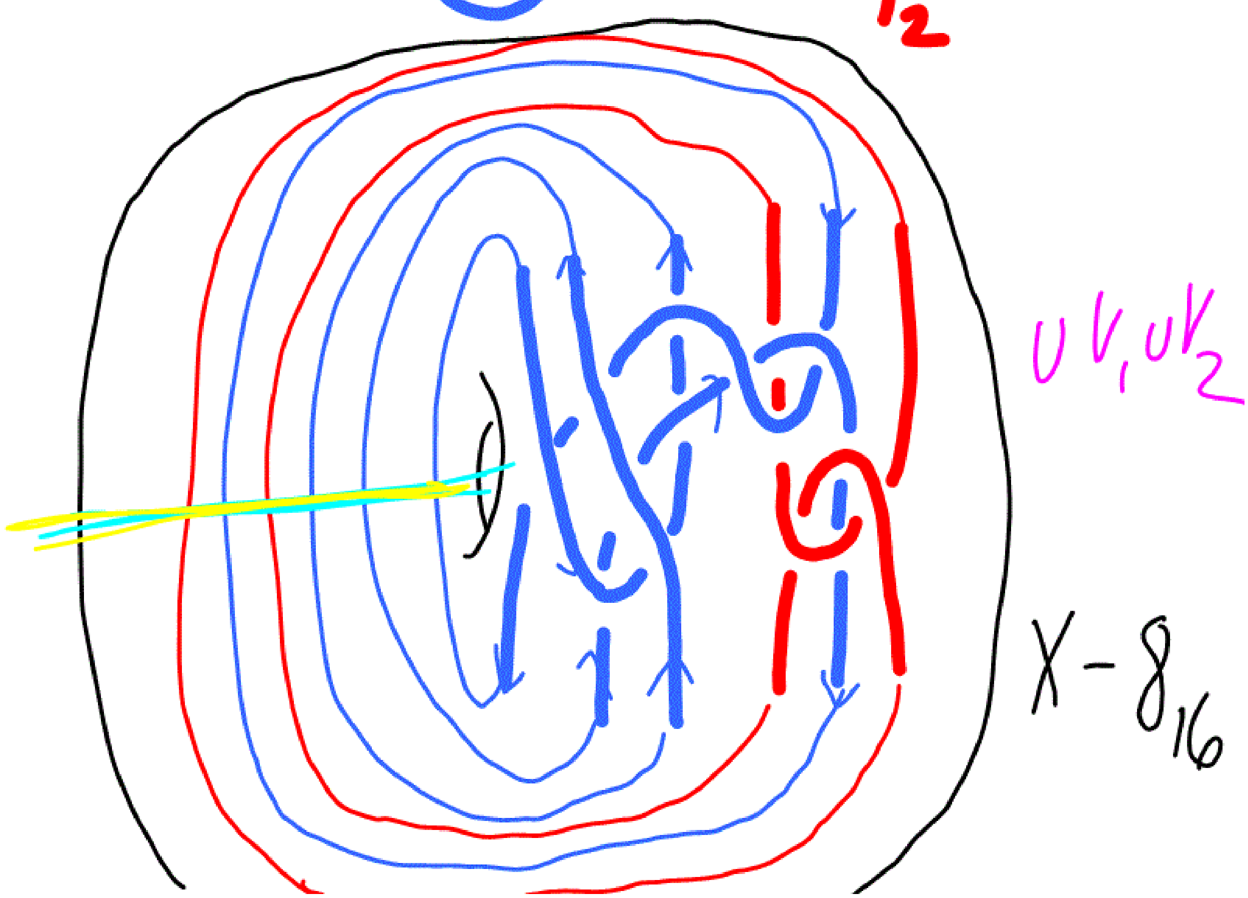
$\widetilde{S^3 \setminus K} =$



Ex 7C2: 8_{16}







$$H_1(\tilde{X}) = $$

$$(\alpha, \beta \mid r_1, r_2)$$

$\bigcup_{i \in \mathbb{Z}}$

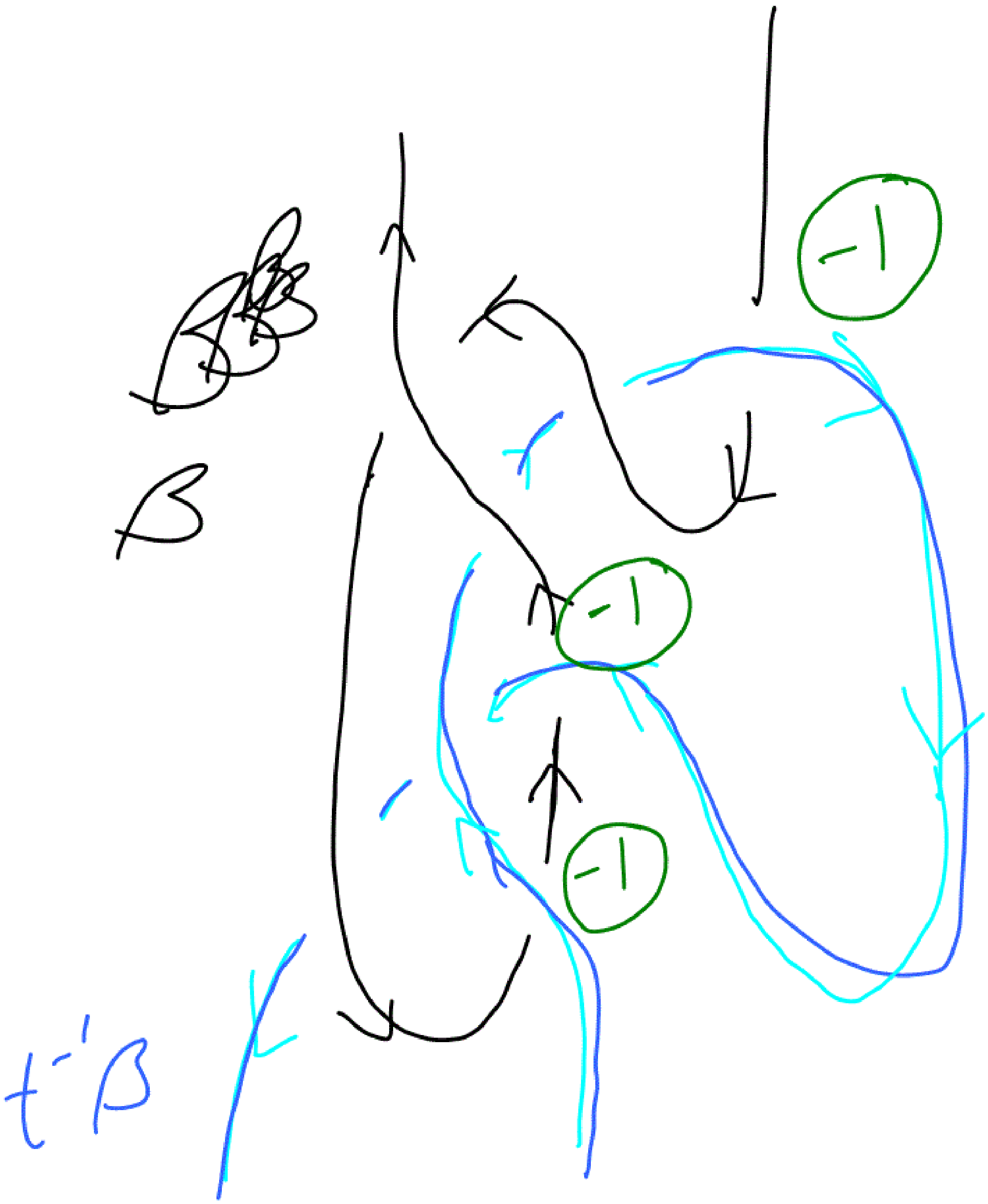
$(-t^{-1}+1-t)\alpha + (t^{-1}-1)\beta = 0$

$\bigcup_{i \in \mathbb{Z}}$

$(t^{-2} - 3t^{-1} + 5 - 3t + t^{2})\beta$

$+ (t-1)\alpha$

$+1$



$$(-t^{-1}+1-t)\alpha + (t^{-1}-1)\beta = 0$$

$$+\ (t-1)\alpha + (t^{-2}-3t^{-1}+5-3t+t^{2})\beta = 0$$

$$-t^{-1}\alpha + (t^{-2}-2t^{-1}+5-3t+t^{2})\beta = 0$$

$$\Rightarrow \alpha = (t^{-1}-2+5t-3t^{2}+t^{3})\beta$$

$$(-t^{-1}+1-t)(t^{3}-3t^{2}+4t-2+t^{-1})\beta + (t^{-1}-1)\beta$$

$$= (-t^{-2}+4t^{-1}-8+9t-8t^{2}+4t^{3}-t^{4})\beta = 0$$

$$\Rightarrow H_1(\tilde{X}) = \Lambda \Big/ -t^{-3}+4t^{-2}-8t^{-1}+9-8t^{-1}+4t^{2}-t^{3}$$

Note $p(t) = p(t^{-1})$ & $-1+4-8+9-8+4-1 = -1$