

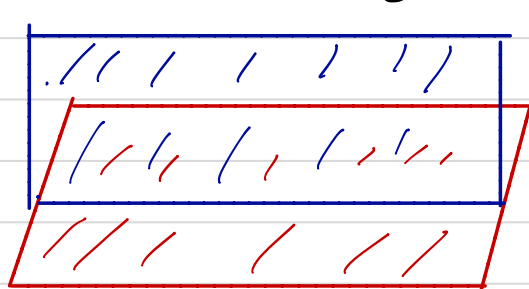
HW6 : please submit Nov. 20th

① Given a hermitian matrix $A = \begin{pmatrix} a_1 & \bar{b} \\ b & a_2 \end{pmatrix}$ of Laurent polynomials $a_i, b \in \mathbb{Z}[t, t^{-1}]$ where $\bar{b}(t) := b(t^{-1})$ and $\bar{a}_i = a_i$.

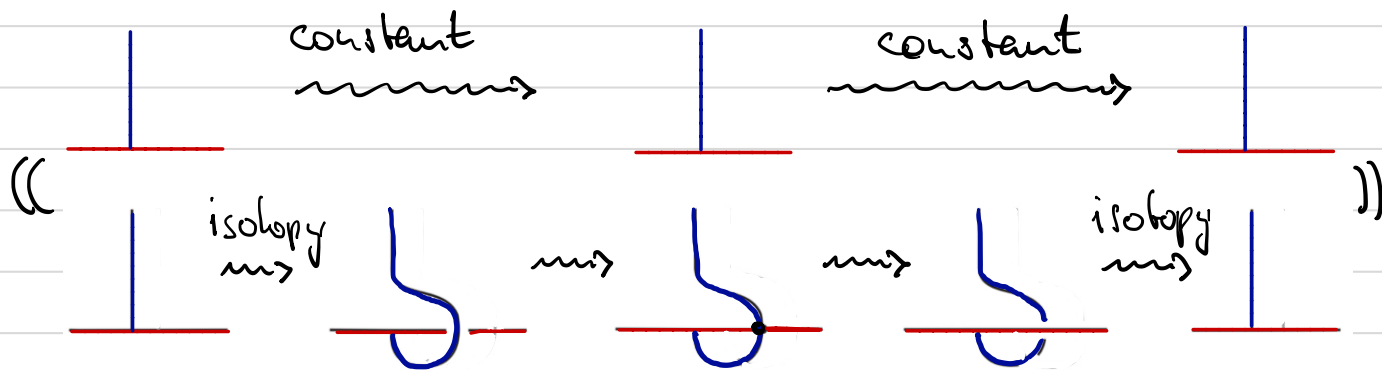
(a) Construct a compact, oriented 4-manifold $M \cong S^1 \vee S^2 \vee S^2$ with λ_M given by A .
Hint: You can use $M = M_L$ where $L: S^1 \# S^1 \# S^1 \hookrightarrow S^3$ with $L_1 = \text{unknot}$

(b) Show that up to units t^u , $\det A$ can be read off from ∂M & $\pi_1 \partial M \rightarrow \mathbb{Z}$.

② Consider $f: I^2 \# I^2 \rightarrow D^3 \times I$ describing two sheets like this:



$\subseteq D^3 \subseteq D^3 \times I$. f is also the constant movie in the upper row of the following picture in D^3 :



Find a "movie of movies" showing that f is homotopic, rel. ∂ , to a boundary twist of f .