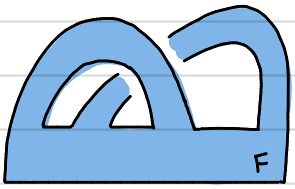
Homework A5 **due Jan 28**

1 a) Let F be a Seifert surface for some knot $K \subset S^3$. Push the interior of F into D^4. Show that π_1 of the complement of this new surface in D^4 is $\mathbb{Z}$.

b) Let F be the punctured torus shown below, after the interior is pushed into B^4. Argue directly (i.e. without using any surgery/Kirby diagrams) that the boundary of the complement is the 3-torus $S^1 \times S^1 \times S^1$.



2a) Redo HW 5.2.c using Kirby diagrams.

HW 5.2.c : If $\Delta := \Delta_1 \sqcup \Delta_2 \sqcup \cdots \sqcup \Delta_k$ is a collection of ribbon discs for an n-component link L, give a presentation for the ribbon group $\pi_1(D^4 \setminus \Delta)$.

b) Show that the boundary of a ribbon disc complement for a knot K is a Dehn surgery on K. What is the framing/Dehn surgery coefficient?
Argue that the same is true for a slice disc for K. (Recall that a slice disc for K is any smooth $D^2 \hookrightarrow D^4$ with $\partial D^2 = K$. In fact, any flat $D^2 \hookrightarrow D^4$ with $\partial D^2 = K$ also suffices.)