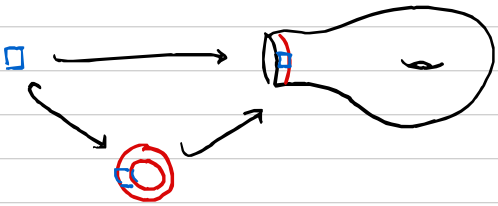
Internal Skeins

1] Suppose $\partial\Sigma = \phi$. What goes wrong when we try to define the internal skein algebra?

Hint: The product runs into trouble.

2] Note that the disk inclusion map factors through the annulus:



so we get

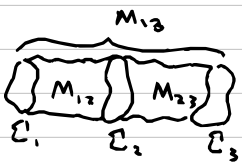
$$\begin{array}{ccc} A & \xrightarrow{P} & SkCat_A(\Sigma) \\ & \searrow^{F} \quad \nearrow_{G} & \\ & Skcat_A(A_{nn}) & \end{array}$$

What's the induced map between internal skein algebras?

3] A surface with one boundary component has a handle and comb decomposition:

use this to give a description of $SkAlg^{int}(\Sigma_g \setminus \mathbb{D})$ in terms of $SkAlg^{int}(Annulus) =: \mathcal{F}$.

Skein Modules



4] Finish the argument that (Sorry!)

$$SkMod(M_{23}) \circ SkMod(M_{12}) \simeq SkMod(M_{13})$$

5] Let H_g be a genus g handle body. Show that $Sk^{int}(H_g)$ is a cyclic $SkAlg^{int}(\Sigma_g^{nn})$-module, generated by the empty skein ϕ.