Skein Categories and Algebras

1| Show that $SkCat_{\mathbb{A}}(\mathbb{D}) \simeq \mathbb{A}$.

2| Extend the assignment $\Sigma \longmapsto SkCat_{\mathbb{A}}(\Sigma)$ to a 2-functor $Surf \longrightarrow Cat$.

3| For what surfaces is $SkCat_{\mathbb{A}}(\Sigma)$ monoidal?

4| Let $F: \mathcal{C} \to \mathcal{D}$ be a functor and $\hat{\cdot}$ be the Yoneda embedding. Show that $\hat{F}(\hat{w}) \simeq \widehat{F(w)}$ as presheaves.

5| The $Rep_q G$ internal skein algebra quantizes the G-representation variety; while the skein algebra quantizes the G-character variety.

- The GIT quotient gives a map $R_G(\Sigma) \to Ch_G(\Sigma)$, so we expect to find something

$$SkAlg(\Sigma) \longrightarrow SkAlg^{int}(\Sigma)$$

suggest a candidate for this map.

Hint: You'll need to make $SkAlg(\Sigma)$ into a presheaf