1. Let $\epsilon \in \{+, -\}^n$ be an ordered sequence of signs. Prove that $\iota = \sum_{S \subset [n]} \iota_S$ is a unit for $\mathcal{A}(\epsilon)$ i.e. $\iota a = a \iota = a$ for all $a \in \mathcal{A}(\epsilon)$.

2. Describe the dg module for a single cup with $\partial^R T = (-, +)$ (Grid diagram in Figure 18 of paper ”An introduction to tangle Floer homology”).

3. Why such pairs of rectangles are forbidden? Explain.

4. Show that $\widetilde{CG}(\mathbb{T})$ with multiplication $m_2$ and differential $d$ is a dg module.

5. Let $T_1$ be a single cup and $T_2$ be a single cap such that $\partial^R(T_1) = \partial^L(T_2) = (-, +)$. Describe the chain complex

\[ \widetilde{CT}(T_1) \boxtimes \widetilde{CT}(T_2) \]

and compute its homology.