MTH 996: Exercises from Week 2

1. Partition the generators of $\text{CF}^0(\mathcal{H})$ for $\mathcal{H}$ the Heegaard diagram shown in Figure 2 of [OSz06] in spin$^c$ structures.

2. Given two nowhere vanishing vector fields on $Y^3$, prove that if $\delta^r(v_i)$ is the induced class in $H^2(Y)$ defined in class, then $\delta^r(v_1) - \delta^r(v_2)$ is independent of the choice of trivialization of $TY$.

3. Check the assertion made in class that given a nowhere vanishing vector field $v$ on $Y$, $\delta^r(v) - \delta^r(-v)$ is the first Chern class of the orthogonal complement $v^\perp$.

4. Determine the chain complexes $\widehat{\text{CFK}}(\mathcal{H})$ and $\text{CFK}^-(\mathcal{H})$ associated to the pringle-chip diagram for the trefoil.

References