REPRESENTATION THEORY, HINTS FOR PROBLEM SET 3

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Problem 1. Hint for c): use the product rule.

Problem 2. Hint for a): how many solutions does $|x|^2 = a$ have (for various a), where $x \in \mathbb{F}_{q^2}^n$?

Hint for c): use a).

Problem 3. When χ is generic, show that there is a nontrivial homomorphism. In general, prove that $\mathbb{C}[B\setminus_{\chi} G] \cong \mathbb{C}[B\setminus_{s_i\chi} G]$ by first co-inducing to P_i, a minimal parabolic subgroup.

Problem 4. Hint for b): Define an analog of the KL basis in $(T_i - q)\mathcal{H}_q(W)$ that happens to be a free $\mathbb{Z}[q^{\pm 1}]$-module with basis $T_{s_i w} - qT_w$, where $\ell(s_i w) > \ell(w)$.

Hint for c): Note that $\ell(s_i w_0) < \ell(w_0)$ for all i.

Problem 5. Hint for a): use that the functor $\mathcal{P}$ is self-adjoint.