0.1. Let \( c = \frac{a}{d} \), where \( d > 1, a > 0, \text{GCD}(a, d) = 1 \). Show that \( \text{Ind}_{\mathfrak{s}^m \mathfrak{s}_{\text{ad}}}^{S^m} L_c((d))^{\otimes m} \) decomposes as \( \bigoplus_{\tau \vdash m} L_c(d\tau)^{\otimes \dim \tau} \), where by \( \dim \tau \) we mean the dimension of the corresponding representation.

0.2. Let \( \mathfrak{g} \) be a Lie algebra and \( \mathfrak{g}_1, \mathfrak{g}_2 \) be subalgebras of \( \mathfrak{g} \) such that \( \mathfrak{g} = \mathfrak{g}_1 + \mathfrak{g}_2 \). Show that, for a \( \mathfrak{g}_1 \)-module, there is a natural isomorphism

\[
\text{Ind}_{\mathfrak{g}_2}^{\mathfrak{g}_1}(V) \cong V/(\mathfrak{g}_1 \cap \mathfrak{g}_2)V.
\]

0.3. Show that \( \langle M_0, M_\infty | \{0, \infty\} \rangle \cong \text{Hom}_\mathfrak{g}(M_0, \mathbb{D}M_1)^* \).