

14 Problem sheet

14.1 IN CLASS: Relations for $su(2)$ and $su(3)$

Investigate

$$\mathrm{Tr} \left(J_k^\dagger J_\ell \right) = \frac{1}{2} \delta_{k\ell} , \quad J_k^\dagger = J_k , \quad \mathrm{Tr} (J_k) = 0 \quad (26)$$

a. for $su(2)$,

b. for $su(3)$.

Write down the definition of the generators. You might have to choose a proper (physics inspired) definition of the generators. I am sorry.

O.k., maybe you want to do it right. Define the math world and the physics world and do derive the generators in both worlds