

Homework Set #1.

- (1) Rotation group $SO(3)$. In this exercise, you will be asked to derive eqs (8.27)
- (a) Start with (8.22) and (8.23). Consider small angle θ , derive the equation between (8.25) and (8.26)
 - (b) Show that T_x, T_y, T_z are given by (8.26)
 - (c) Confirm $[T_x, T_y] = i T_z$
 - (d) prove the two expressions in part 4 of Exercise 8.5.1, p245
 - (e) show that
$$\vec{V}' = e^{-i\theta(\vec{T} \cdot \hat{n})} \vec{V}$$
$$= [\text{expression given in eq. (8.23)}]$$
- (2) Exercise 8.5.5, p247.
prove the Thomas - Reiche - Kuhn sum rule.