

Reading: Chapter 9.6, 9.9, 10.1-5

Problems:

1. The Hamiltonian for a particle, described in terms of a cartesian position vector $\vec{r}(t)$ and conjugate momentum $\vec{p}(t)$, is $H = p^2/2m + V(\vec{r})$. Construct generators of infinitesimal canonical transformations representing changes that \vec{r} and \vec{p} undergo when the observer moves to a frame (a) moving at a constant velocity along direction \vec{n} and (b) rotating at a constant angular velocity around an axis passing through the coordinate origin, directed along \vec{n} . What are the small parameters of transformation in these two cases? Are the transformations restricted? Are values of the Hamiltonian changed?
2. Goldstein, Problems 10-5.
3. Goldstein, Problem 10-8.
4. Goldstein, Problem 10-26.