

Physics 263: BTM Problem Set #6

This assignment addresses a major physics application of Lagrange multipliers and then focuses on using the three-dimensional coordinate systems, which we'll need repeatedly and build upon. Please ask questions! It is due by 5:30pm in the box in 1011 on Tuesday, April 18.

1. **BTM Problem 3.1.7.** In this problem, the Boltzmann distribution that we've used in earlier problems is derived. Make sure you do each of the parts.
2. **BTM Problem 3.2.4.** Once you're used to spherical coordinates, this one is trivial.
3. **BTM Problem 3.2.5.** A basic moment-of-inertia problem. What coordinate system will you choose to make the problem easiest?
4. **BTM Problem 3.2.8.** Draw a picture first to decide how to set up the integral for the volume.
5. **BONUS: BTM Problem 3.2.7.**