Homework 3
Due: *Friday, February 25, 2022*

1. Consider a sphere of plasma
(a) If the radius is R and the temperature is T, what is the kinetic energy contained within the sphere?
(b) Suppose all of the electrons contained within this sphere spontaneously move out to a radius R, what is the resulting electrostatic energy contained within the sphere?
(c) For what value of R are the expressions in part (a) and (b) equal?
(d) What is the relationship between this value and the Debye length?

2. Prove that $\vec{\nabla}_v \cdot \vec{a} = 0$ for the Lorentz force, $q(\vec{E} + \vec{v} \times \vec{B})$.