[mex104] Gravitational self energy of a homogeneous massive sphere

(a) Determine the gravitational self energy of a homogeneous sphere of radius R and mass M. (b) Infer, by analogy, the electrostatic self energy of a homogeneous, spherical charge distribution (radius R, total charge q). (c) Under the (quite unrealistic) assumption that the total energy $E = m_e c^2$ of an electron at rest consists entirely of electrostatic self energy, determine the radius of the electron (in SI units). This value is known under the name *classical electron radius*.

Solution: