1. (Jackson 6.11)
A transverse plane wave is incident normally in vacuum on a perfectly absorbing flat screen.
(a) From the law of conservation of linear momentum, show that the pressure (called radiation pressure) exerted on the screen is equal to the field energy per unit volume in the wave.
(b) In the neighborhood of the earth the flux of electromagnetic energy from the sun is approximately 1.4 kW/m$^2$. If an interplanetary "sailplane" had a sail of mass 1 g/ m$^2$ of area and negligible other weight, what would be its maximum acceleration in meters per second squared due to the solar radiation pressure? How does this answer compare with the acceleration due to the solar "wind" (corpuscular radiation)?

2. (Jackson 6.16)
(a) Calculate the force in newtons acting on a Dirac monopole of the minimum magnetic charge located a distance 0.05 nm from and in the median plane of a magnetic dipole with dipole moment equal to one nuclear magneton ($eh/2m_p$).
(b) Compare the force in part a with atomic forces such as the direct electrostatic force between charges (at the same separation), the spin–orbit force, the hyperfine interaction. Comment on the question of binding of magnetic monopoles to nuclei with magnetic moments. Assume the monopole mass is at least that of a proton.