Charged Particle in Circular Motion

A proton with speed $v = 3.00 \times 10^5$ m/s orbits just outside a charged conducting sphere of radius $r = 1.00$ cm.

(a) Find the force F acting on the proton.

(b) Find the charge per unit area σ on the surface of the sphere.

(c) Find the total charge Q on the sphere.

Note: Charged particles in circular motion lose energy through radiation. This effect is ignored here.