M08E.2 - Accelerating Point Charge

Problem

A particle with charge e starting at rest is given uniform acceleration, a, for a time Δt to non-relativistic energies.

a)   Compute the power radiated per unit solid angle by the electric charge as a function of the angle θ measured with respect to its direction of acceleration.

b)   Assume the time Δt is infinitesimally short. Compute the total energy radiated per unit wavelength as a function of the final velocity v and wavelength λ of the radiated electromagnetic waves.