

Assignment 11
PHGN361

Homework due April 13

1. Read section 7.1.1 and 7.1.2, 7.1.3.
2. Problem 7.7, 7.8, 7.9
3. Can the electric field at the edge of a capacitor with rectangular plates end abruptly (as you move out of the capacitor)? Explain your reasoning.
4. A charge Q moves at speed V parallel to a current carrying wire but a distance D away from the wire. From the discussion in class, show that in the frame of Q the force on Q force has the same dependence on V , D that you would expect from the Lorentz force.
5. Medication is sometimes injected by putting a voltage on electrodes placed at each side of the body with the ionic medication on the inside of one electrode. Assume that the transport efficiency is 10^{-3} of the charge delivered in such a circuit. Also assume that the body is made of salt water. Estimate from this simple model how long would it take to deliver 10^{12} molecules of this medication with 12 volts applied to electrodes across the torso?