

HW 4 – Energy and Conductors

Due September 25, 2009, 5 pm

These problems will help you see the connection between potential and energy. You will also explore the properties of conductors and capacitors.

All problems are from Griffiths, Chapter 2.

1. Problem 2.28 (p. 87)
2. Problem 2.30b (p. 90)
3. Problem 2.31 (p. 93) Describe in words the process of assembling the charges: who does work on what and where does the energy go?
4. Problem 2.36 (p. 101)
5. Problem 2.38 (p. 103)
6. Griffiths, 2.51 (p. 109). Use the method that seems easiest to you. You could look at 2.32 & 2.33 (p. 95) for ideas.
7. Why don't you ever want to put tin foil (or a fork) into a microwave oven?
8. Find an approximation of the capacitance of the Earth in farads. If the electric field near the surface of the Earth is ~ 100 V/m, what is the approximate electrical energy of the Earth? (Ignore the ionosphere.)