

## Problem Set #3

Due Wednesday, October 10, 2007

1. Consider a piece of wire of length  $L$  carrying a total electrical charge  $Q$ . Recall that the electric potential associated with a point charge  $q$  is  $V_q = q/4\pi\epsilon_0 d$  where  $d$  is the distance from the charge.

Choose an appropriate set of coordinates with the origin at the mid-point of the wire and find the total potential at a general point  $\mathbf{P}$  in space.

You may use a table of integrals or MAPLE to evaluate any integral you encounter.

2. RHB Problem 10.14.
3. RHB Problem 10.17.
4. RHB Problem 11.9.
5. RHB Problem 11.11.

Additional problem for practice -- **REQUIRED FOR PH561 STUDENTS!**

6. RHB Problem 11.1.