

HW#7; Due Wed. April 5.

Reminder: No class on Monday April 3. Read through the beginning of chapter 12, and come to class on 4/5 with some thoughts and questions about special relativity!

1) Problem 10.4 (both editions). Note that  $E$  isn't zero, even though  $V=0$ !

2) A charge  $Q$  moves on the  $z$ -axis, with a constant acceleration of  $g$ . (At  $t=0$  it is at rest at the origin; before and after  $t=0$  it stays on the  $z$ -axis in the  $+z$  direction.)

A) For a point  $z=D$ , on the  $z$ -axis, at  $t=0$ , find the location of the charge at the **retarded** time. There should be only one solution.

B) What is the (scalar) potential at this point ( $z=D$ ), at  $t=0$ ? (Warning: there's an effective change of the charge due to the effect discussed in section 10.3.1; to account for this you'll have to use the equation (10.46).)

C) What is the vector potential at this same point, at the same time? (Use 10.47).

D) For a point  $x=D$ , on the  $x$ -axis, at  $t=0$ , find the location of the charge at the retarded time. No need to work the potentials for this case.

3) Read through chapter 12.1 on special relativity!