Physics 110B, Problem Set 2

Due Friday, January 24, 11:59pm

Upload to Gradescope
To help out with grading, please circle your final answers.

1 Griffiths Problem 7.13 5th edition, 7.12 4th edition

2 Griffiths Problem 7.16 5th edition, 7.15 4th edition

3 Griffiths Problem 7.25 5th edition, 7.24 4th edition

4 Griffiths Problem 7.28 5th edition, 7.27 4th edition

5 Griffiths Problem 7.47 5th edition, 7.44 4th edition

Only parts (a) and (b).

6 Griffiths Problem 7.54 5th edition, 7.51 4th edition

Hint: You will be using the equation that connects the curl of the electric field to the time derivative of the magnetic field. To calculate the time derivative at a time t , I would recommend that you work in cartesian coordinates. Then, once you set $t = 0$ you should switch to cylindrical coordinates.

7 Problem 7

The superconducting magnet of the CMS experiment at CERN[1] is a solenoid of length 13 m, diameter 6 m, yielding a magnetic field of 3.8 T. Calculate the energy stored in the magnetic field, expressing your answer not in Joules but in TNT-tons equivalent. (Look up the conversion factor on the web)

[1] `https://en.wikipedia.org/wiki/Compact_Muon_Solenoid`