Physics 24 Problem Set 1

Harry Nelson

due Monday, Jan. 16 at 5pm

Course Announcements:
Review Appendix A of Purcell, Read Chapter 5, and read Appendix B.

1. Purcell 5.2

2. Purcell 5.5

3. Purcell 5.8

4. A charge of $q = 100$ esu sits at the origin, $x = y = 0$, initially at rest. Make a curve in the first quadrant of the $x - y$ plane that depicts all the points where the electric field has a magnitude of 1 statvolt/cm. Are the field lines always perpendicular to that curve where they intersect it? Now repeat, but assume that the charge q has an x component of velocity that is $0.9c$. Don't forget to analyze whether or not the field lines are always perpendicular to the resulting curve where they intersect it.

5. Purcell 5.13

6. Purcell 5.15

7. Purcell 5.17

8. Purcell B.1 (Appendix B)

9. Purcell B.2