Physics 114 – Spring 2010 – Problem Set 7 (Due at end of class on March 18)

1) 27-69
2) 28-3
3) 28-13
4) 28-18
5) 28-19
6) 28-26
7) 28-35
8) Review your class notes from March 4 and 16 where we did problem 28-31. Then do problem 28-32.
9)

A wire lies parallel to a conducting pipe of radius R and thickness ¼ R. The wire lies at a distance of 3R from the center of the pipe. The wire and pipe are configured perpendicular to the paper, as shown below in a sketch. The pipe carries a uniform current of magnitude I directed into the paper. The current is in the region shown. That is to say, the interior of the pipe ($r<3/4/R$) is empty and carries no current.

(a) Determine the magnitude and direction of current in the wire which will cause the magnetic field at point P to be zero.
(b) Given your answer to part (a), what is the magnitude and direction of the magnetic field at the center of the current-carrying pipe?