Physics Problem Set #9

Show your work if you want partial credit.
Due Friday, Apr. 23

1. A proton traveling east at 2.0×10^5 m/s enters a magnetic field of 0.20 T pointing straight up. What is the force acting on the proton?

2. An electron traveling to the left, moves into a magnetic field directed toward the observer. Trace the path of the particle, assuming it eventually leaves the field.

3. A horizontal conductor is carrying 5.0 A of current to the east. A magnetic field of 0.20 T pointing straight up cuts across 1.5 m of the conductor. What is the force acting on the conductor?

4. A 50.0 cm horizontal section of conductor with a mass of 8.00 g is in a 0.400 T magnetic field directed to the west. What are the magnitude and direction of current required to make this section of the conductor seem weightless?

5. A thin 2.18m long copper rod in a uniform magnetic field has a mass of 52.2g. When the rod carries a current of 0.260 A, it floats in the magnetic field.
What is the field strength of the magnetic field? Answer in T.

6. The magnetic force on a straight 0.37m segment of wire carrying a current of 4.5 A is 0.60 N. What is the magnitude of the component of the magnetic field that is perpendicular to the wire? Answer in T.