Planet Holloway **websheet 19.1**
AP Physics 2 - Chapter 11 Magnetism
You may print this out and write on it or work on your own paper.
Show all work.

1. An electron is moving 350 m/s across the plane of the page horizontally to the right. If there exists a magnetic field of 0.8 T oriented parallel to the plane of the page and 40° left of vertical, what is the force exerted on the electron?

2. A proton moves into the page through a magnetic field of 2 T oriented to the right in the plane of the page and through an electric field of 500 V/m oriented vertically in the plane of the page. For what velocity will the proton travel straight without veering as it moves through both fields?

3. A copper wire 12 cm long and a mass of 16 g is in a magnetic field of 1.2 T oriented perpendicular to the wire. What current would create a force strong enough to levitate the wire?

4. A horizontal wire 1 m long carries 0.4 A and is oriented 30° N of W. The Earth's magnetic field runs due north at this location and is 1.5×10^{-5} T in strength. What is the magnitude and direction of the magnetic force on the wire?

5. What is the path of an electron moving at 4 000 m/s perpendicular to a magnetic field of 1.5 T? ($m_e = 9.11 \times 10^{-31}$kg)

6. How long does it take a proton ($m_p = 1.67 \times 10^{-27}$ kg) moving in an orbit perpendicular to a magnetic field of 2 T to complete one circular orbit?

Answers:

1. 3.43×10^{-17} N

2. 250 m/s

3. 1.11 Amps

4. 5.2×10^{-6} N down toward the Earth's surface

5. Circle of radius 1.5×10^{-8} m

6. 3.28×10^{-8} s