PHYSICS IN MOTION
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Unit 5J
Magnetism
Practice Problems

Name:

Date:

Work each of the following problems. SHOW ALL WORK.

1. Using the right-hand rule, in which direction will the magnetic force act on a positively charged particle that is moving to the left and experiencing a magnetic field straight ahead?

2. Using the right-hand rule, in which direction will the magnetic force act on a negatively charged particle that is moving to the left and experiencing a magnetic field straight down?

3. Two charged particles, each having the same magnitude of charge but with opposite signs, enter a magnetic field that is perpendicular to their direction of motion. How will the motion of the two particles differ when they enter the magnetic field?

4. An electron that is moving to the right experiences a magnetic field of 2.5 T directed upward. If the force on the electron is 2.4×10^{-12} N, what is the speed of the electron?

5. A proton is moving north at 7.5×10^{7} m/s, and encounters a uniform magnetic field of 4.5 T directed east. What are the magnitude and direction of the force that act on the proton?

questions continued on next page

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6. What is the magnitude of charge on a particle that is moving at 3.6×10^{6} m/s and experiences a magnetic force of 1.2×10^{-10} N when it encounters a magnetic field of 3.0 T?

7. What are the direction and magnitude of a magnetic field that act upon a proton moving to the left at 4.2×10^{8} m/s and experiences a force of 1.4×10^{-10} N downward?

8. An electron moves to the west at 1.2×10^{6} m/s and experiences a magnetic force of 6.0×10^{-13} N upward. What is the magnitude and direction of the magnetic field acting on the electron?