

Section

21-3

HOLT PHYSICS

Concept Review*Magnetic Force*

The charge of an electron is 1.60×10^{-19} C.

1. A proton is moving along the positive x -axis with a speed of 1.50×10^5 m/s in a magnetic field of 2.00 T that is oriented along the positive y -axis.

a. In the space below, sketch a diagram representing \mathbf{B} and \mathbf{v} .

- b. Find the direction and magnitude of the electromagnetic force on the proton.

- c. What is the force when the proton moves along the y -axis?

2. Repeat item 1 for an electron.

3. Repeat item 1 for an alpha particle made of two protons and two electrons.

4. If the magnetic field is uniform along the y -axis, do the particles in items 1, 2, and 3 keep moving in a straight line? Describe their path.
