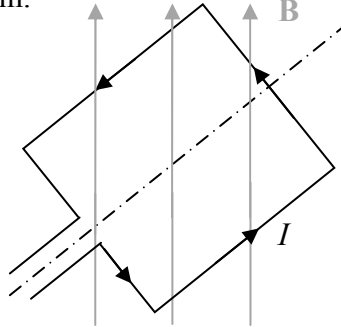


**W13.02****Conceptual Questions**

1. You have two electrically neutral metal cylinders that exert strong attractive forces on each other. You have no other metal objects. Can you determine if *both* of the cylinders are magnets, or if one of them is a magnet and the other just a piece of iron? If so, how? If not, why not?
2. A current-carrying rectangular loop of wire is placed in a magnetic field with the direction of the current and field as shown. In what direction will this loop tend to rotate as a result of the magnetic torque exerted on it? Explain.



3. Wires carry current into and out of the page as indicated. Draw an arrow representing the direction that a compass needle would point due to the magnetic field at the indicated points (small dots).



4. A horizontal wire is oriented along an east-west line, and a compass is placed above it. Will the needle deflect when a current flows through the wire from east to west, and if so, in what direction? Explain.
5. A positively charged particle is at rest in a uniform magnetic field. Is there a magnetic force acting on the particle? Explain.
6. Why does a DC motor require a split-ring commutator to work?
7. What is the basic *similarity* between a generator and an electric motor?
8. What is the basic *difference* between a generator and an electric motor?