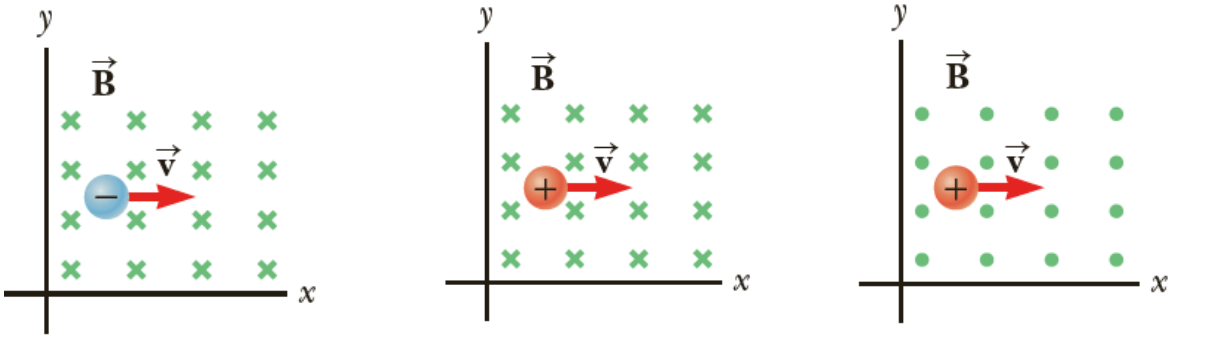
AP Physics C: Electricity & Magnetism Name: _____

Unit 5 Quiz

Directions: Show all steps required to arrive at your answer and give answers with the correct units if applicable. **A correct answer with no justification will receive no credit.**

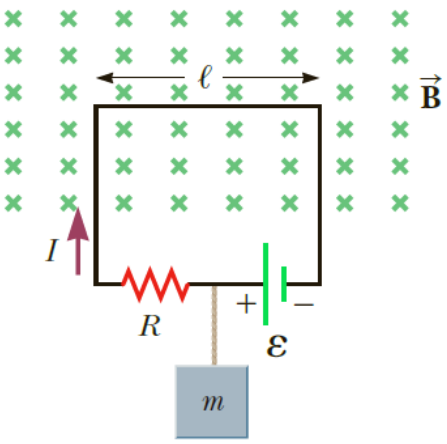
1. Indicate the direction the particle will move.

a) _____ b) _____ c) _____

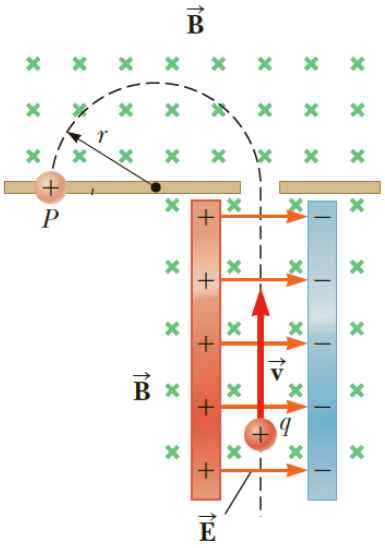


2. A particle (mass = .005 kg, charge = 2.0 μC) moves in the positive direction along the z axis with a velocity of 50000.0 m/s. It enters a magnetic field of B = (1.0**i** - 3.0**j** + 7.0**k**) T. What is the magnitude of the acceleration of the particle?

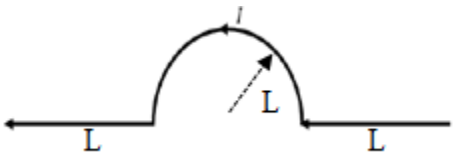
3. Mass $m = 1.0\ kg$ is suspended vertically at rest by an insulating string connected to a circuit partially immersed in a magnetic field as shown. The magnetic field has magnitude $B = 2.0\ T$ and the length $l = 0.5\ m$. If the battery voltage is $\varepsilon = 120\ V$, find the required value of resistance R.



4. Brood about the mass spectrometer shown schematically. The electric field between the parallel plates if 950 V/m, and the magnetic fields in all regions have magnitude of 0.930 T. Calculate the radius of the path in the system for a charged ion with mass 2.2×10^{-26} kg.



5. A section as shown carries a current of I = 3.0. Wow, that's a lot of current. The wire has straight sements of length L = 0.2 m as shown and the circular section has a radius of L = 0.2 as well. Calculate the magnetic field at the center of the circular section.



6. The two wires shown have opposite currents, I and 2I, and are separated by a distance r. If the wires have equal lengths L, find the direction and magnitude on the wire with current 2I.