Chapter-29

1. One long wire carries current 30.0 A to the left along the x axis. A second-long wire carries current 50.0 A to the right along the line (y = 0.280 m, z = 0). (a) Where in the plane of the two wires is the total magnetic field equal to zero? (b) A particle with a charge of -2.00 μC is moving with a velocity of 150 i ⁄ Mm/s along the line (y = 0.100 m, z = 0). Calculate the vector magnetic force acting on the particle. (c) What If? A uniform electric field is applied to allow this particle to pass through this region undeflected. Calculate the required vector electric field.
2. Two long wires hang vertically. Wire 1 carries an upward current of 1.50 A. Wire 2, 20.0 cm to the right of wire 1, carries a downward current of 4.00 A. A third wire, wire 3, is to be hung vertically and located such that when it carries certain current, each wire experiences no net force. (a) Is this situation possible? Is it possible in more than one way? Describe (b) the position of wire 3 and (c) the magnitude and direction of the current in wire 3.
3. Consider the hemispherical closed surface in Figure P29.27. The hemisphere is in a uniform magnetic field that makes an angle *θ* with the vertical. Calculate the magnetic flux through (a) the flat surface S1 and (b) the hemispherical surface S2.

