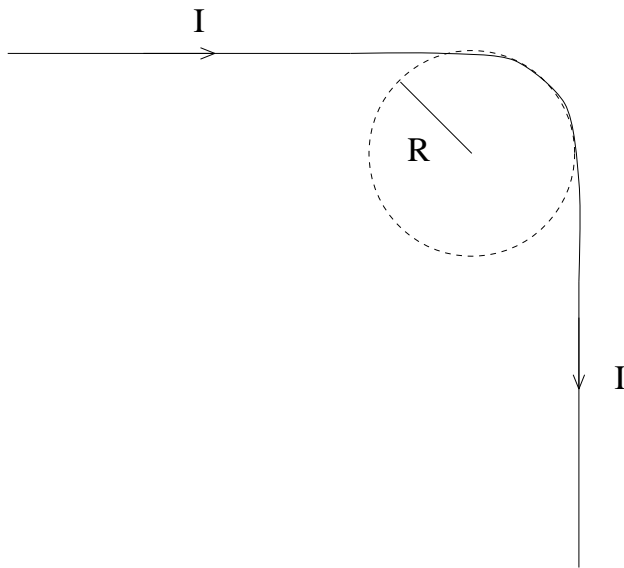


1. An infinitely long wire carrying current  $I$  is bent  $90^\circ$  such that the radius of curvature of the corner is  $R$ . Find the magnetic field (magnitude **and** direction) at the center of curvature. Hint: use the Biot-Savart law.



2. A hollow conducting cylindrical shell of radius  $R$  is infinitely long and runs parallel to the  $z$ -axis which is the symmetry axis of the shell. The shell carries surface current density  $K = -M \cos(\phi)\hat{z}$ , where  $M$  is a constant and  $\phi$  is the azimuthal angle in cylindrical polar coordinates. Find the magnetic field (magnitude **and** direction) along the  $z$ -axis. Hint: break up the surface current into parallel wires and use Ampere's law.