

The *figure* shows a loop made of a piece of copper wire. The shape of the loop is two concentric semi-circles and two connecting straight line segments. The loop is on a horizontal tabletop, but initially the smaller semi-circle is in a vertical position. The small semi-circle is turned into the horizontal position in 1 s. The dashed line is the axis of rotation. The whole loop is in uniform vertically upward magnetic field.



- a) In which case is the flux linkage of the loop greater?
  - b) What is the average value, and the direction of the induced current in the loop, while the smaller loop turns? What is the direction of the current?
  - c) What is the greatest value of the induced current if the small semicircle is rotated at a constant angular speed and it takes exactly  $\Delta t = 1$  s to turn from the vertical position to the horizontal position?
- Data:* the magnetic induction is  $B = 0.35$  T, the resistance of the loop is  $R = 0.025 \Omega$ , the radius of the smaller semi-circle is  $r = 0.2$  m.