NAME & ID

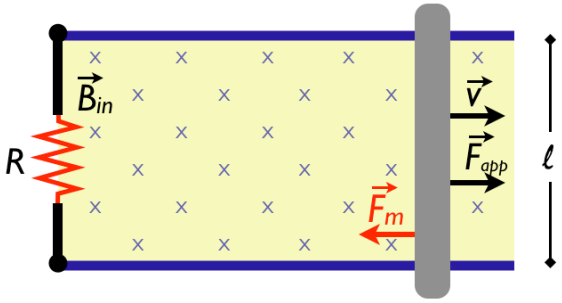
PH 102 / LeClair Summer II 2009

$\Delta V = Blv \qquad \Delta V = IR \qquad \mathcal{P} = I^2 R \qquad \mathcal{P} = \vec{\mathbf{F}} \cdot \vec{\mathbf{v}}$

Quiz 7: Induction

1. During an in-class demonstration, we dropped a magnet and a non-magnet of equal weight and size through a copper tube. The non-magnet fell through the tube at the expected rate, but the non-magnet took many times longer to fall out, due to eddy current braking. Is it possible to have a magnet strong enough (or a tube conductive enough, *etc*) that it would actually *stop* inside the tube? Explain.

2. A conducting rod of length l moves on two (frictionless) horizontal rails, as shown to the right. A constant force of magnitude $|\vec{\mathbf{F}}_{\text{app}}| = 1.0\,\text{N}$ moves the bar at a uniform speed of $|\vec{\mathbf{v}}| = 2.0\,\text{m/s}$ through a magnetic field $\vec{\mathbf{B}}$ directed into the page. The resistor has a value $R = 8.0\,\Omega$.



What is the current through the resistor R?