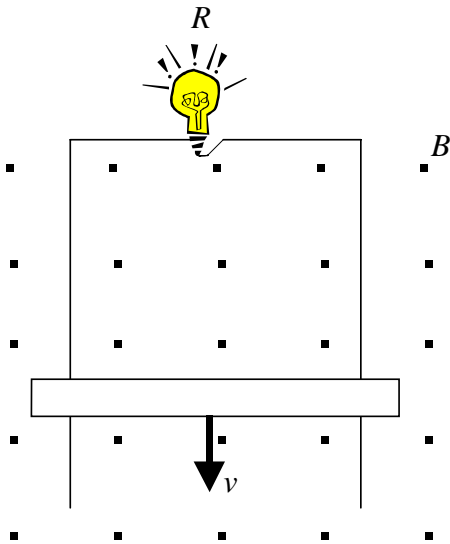


Chapter 30 Examples, Faraday and Lenz's Law

1) A uniform B-Field is oriented as shown and a conducting rod is free to slide across the conducting rails which are connected to a light bulb with a resistance $R = 115$ Ohms. (Assume the resistance of the rod and rails are negligible.) If the velocity of the rod, v , is 4 m/s, the length of the rod, L , is 1.2 meters and the B-field is 0.7 Tesla, determine the following quantities:

- the induced emf in the rod and its polarity. [SHOW ALL WORK!]
- the induced current in the circuit and its direction.
- the electrical power delivered to the bulb.
- the energy used by the bulb in 30 seconds.
- the direction and magnitude of the magnetic force on the rod (caused by the induced current).
- the work done by F_{hand} in 30 seconds.



2) A conducting loop is moving toward a long, straight, current carrying wire as shown below. The loop is of width, w , and length, l , and its edge nearest the wire is a perpendicular distance, x , from the wire. If the loop is moving at a velocity, v , toward the wire, determine the induced emf in the conducting loop.

