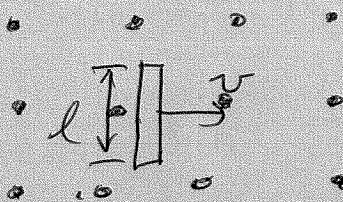


Ch. 13 Prob 42

$$B = 0.50 \text{ T}$$

$$v = 8.0 \text{ m/s}$$

$$l = 5.0 \text{ cm}$$



Find the potential difference between the ends of the rod.

$$v = \frac{E}{B} \rightarrow E = vB \Rightarrow l \cdot E = l v B$$



$$V = l v B$$

$$= (5.0 \times 10^{-3} \text{ m})(8.0 \text{ m/s})(0.50 \text{ T})$$

$$V = 0.020 \text{ V}$$

If positive charge could move in the bar, it would experience a magnetic force in the downward direction due to motion to the right through a magnetic field in the  $+z$  direction.

Negative charges will move in the opposite direction. Therefore the bottom of the rod will be at a higher potential.

