

61. (a) We seek the electrostatic field established by the separation of charges (brought on by the magnetic force). We use the ideas discussed in §29-4; especially, see SAMPLE PROBLEM 29-2. With Eq. 29-10, we define the magnitude of the electric field as $|\vec{E}| = v|\vec{B}| = (20)(0.03) = 0.6 \text{ V/m}$. Its direction may be inferred from Figure 29-8; its direction is opposite to that defined by $\vec{v} \times \vec{B}$. In summary,

$$\vec{E} = -0.600 \text{ V/m } \hat{k}$$

which insures that $\vec{F} = q(\vec{E} + \vec{v} \times \vec{B})$ vanishes.

- (b) Eq. 29-9 yields $V = (0.6 \text{ V/m})(2 \text{ m}) = 1.20 \text{ V}$.