32.28. **Model:** A magnetic field exerts a force on a moving charge.
Visualize: Please refer to Figure Ex32.28.
Solve: **(a)** The force on a charge moving in a magnetic field is

$$\vec{F}_{\text{on q}} = q\vec{v} \times \vec{B} = (qvB\sin\alpha, \text{ direction of right-hand rule})$$

The direction of the force on a negative charge is opposite the direction determined by the right-hand rule. The magnetic field must be in a plane perpendicular to both the $\vec{v}$ and $\vec{F}$ vectors. Using the right-hand rule for a *positive* charge moving to the right, the $\vec{B}$ field must be *out* of the page.
(b) The force $\vec{F}$ on the *negative* charge is into the page. Since the velocity is to the right, the magnetic field $\vec{B}$ must be *up*.