

**32.29. Model:** A magnetic field exerts a force on a moving charge.

**Visualize:** Please refer to Figure Ex32.29.

**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. Since the force  $\vec{F}$  is *out of the page* and the velocity of the negative charge is to the left and up in the plane of the paper, the magnetic field  $\vec{B}$  must be in the plane of the page,  $45^\circ$  clockwise from straight up.

(b) The magnetic field on the positive charge is in the plane of the page,  $45^\circ$  counterclockwise from straight down.