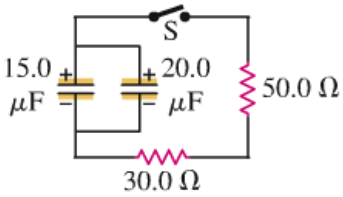
D 1

26.43 •• **CP** In the circuit shown in Fig. E26.43 both capacitors are initially charged to 45.0 V. (a) How long after closing the switch S will the potential across each capacitor be reduced to 10.0 V, and (b) what will be the current at that time?

Figure **E26.43**



D 2

A particle with a charge of − 5.50 nC is moving in an uniform magnetic field of $\vec{B} = -(1.28T)\hat{k}$. The magnetic force on the particle is measured to be $\vec{F} = -(3.90 \times 10^{-7}N)\hat{\imath} + (7.60 \times 10^{-7}N)\hat{\jmath}$.

Calculate the *x, y, and z* components of the velocity of the particle and determine the angle between the velocity and the magnetic force.

D 3

A group of particles is traveling in a magnetic field of unknown magnitude and direction. You observe that a proton moving at 1.60 km/s in the +*x*-direction experiences a force of $2.10 \times 10^{-16}N$ in the +*y*-direction, and an electron moving at 4.30 km/s in the −*z*-direction experiences a force of $8.30 \times 10^{-16}N$ in the +*y*-direction.

What is the magnitude and direction of the magnetic force on an electron moving in the −*y*-direction at 3.30 km/s?

D 4

27.55 • When a particle of charge $q > 0$ moves with a velocity of $\vec{v}_1$ at 45.0° from the $+x$-axis in the xy-plane, a uniform magnetic field exerts a force $\vec{F}_1$ along the $-z$-axis (Fig. P27.55). When the same particle moves with a velocity $\vec{v}_2$ with the same magnitude as $\vec{v}_1$ but along the $+z$-axis, a force $\vec{F}_2$ of magnitude F_2 is exerted on it along the $+x$-axis. (a) What are the magnitude (in terms of q, v_1, and F_2) and direction of the magnetic field? (b) What is the magnitude of $\vec{F}_1$ in terms of F_2?

Figure **P27.55**