Problem 6. A proton moves with a velocity of $v = (2\hat{i} - 4\hat{j} + \hat{k})$ m/s in a region in which the magnetic field is $B = (\hat{i} + 2\hat{j} - 3\hat{k})$ T. What is the magnitude of the magnetic force this charge experiences?

Problem 8. An electron moves in a circular path perpendicular to a constant magnetic field of magnitude $B = 1.00$ mT. The angular momentum of the electron about the center of the circle is $L = 4.00 \cdot 10^{-25}$ Js. Determine (a) the radius of the circular path and (b) the speed of the electron.

Problem 16. A wire $l = 2.80$ m in length carries a current of $I = 5.00$ A in a region where a uniform magnetic field has a magnitude of $B = 0.390$ T. Calculate the magnitude of the magnetic force on the wire assuming that the angle between the magnetic field and the current is (a) $\theta_a = 60.0^\circ$, (b) $\theta_b = 90.0^\circ$, and (c) $\theta_c = 120^\circ$. 