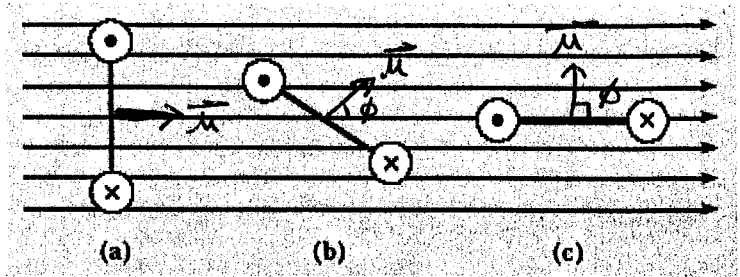


Name:

Key

ID #

1- Rank the magnitudes of the torques acting on the rectangular loops shown edge-on in the figure, from highest to lowest. All loops are identical and carry the same current.



$$\vec{\tau} = \vec{\mu} \times \vec{B}$$

$$\tau = \mu B \sin \phi$$

$$\tau_c > \tau_b > \tau_a$$

2- An electron moving at right angle to a uniform magnetic field completes a circular orbit in 10^{-8} s. What is the magnitude of the magnetic field?

$$T = 10^{-8} \text{ s} = \frac{2\pi r}{v}$$

$$qvB = m \frac{v^2}{r}$$

$$\Rightarrow v = \frac{qBr}{m}$$

$$10^{-8} = \frac{2\pi r m}{qB r} = \frac{2\pi m}{qB}$$

$$B = \frac{2\pi m}{q(10^{-8})} = \frac{2\pi (9.11 \times 10^{-31})}{1.6 \times 10^{-19} (10^{-8})} = 3.58 \times 10^{-3} \text{ T}$$