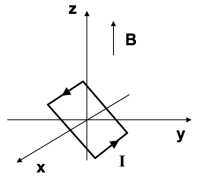
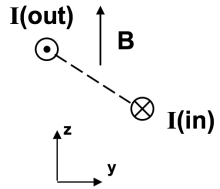




The force on a segment of wire L is $\mathbf{F} = I\mathbf{L} \times \mathbf{B}$

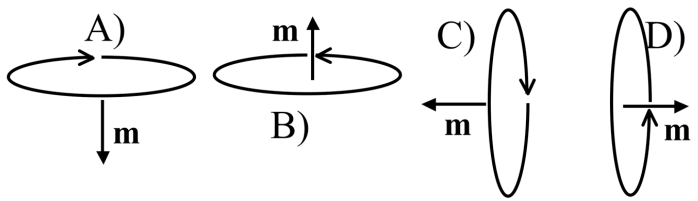
A current-carrying wire loop is in a constant magnetic field $\mathbf{B} = B\hat{z}$ as shown. What is the direction of the torque on the loop?

A. Zero
B. +x
C. +y
D. +z
E. None of these

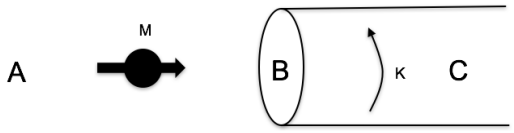
The torque on a magnetic dipole in a B field is:

$$\tau = \mathbf{m} \times \mathbf{B}$$

How will a small current loop line up if the B field points uniformly up the page?



Suppose I place a small dipole $\mathbf{M}$ at various locations near the end of a large solenoid. At which point is the magnitude of the force on the dipole greatest?



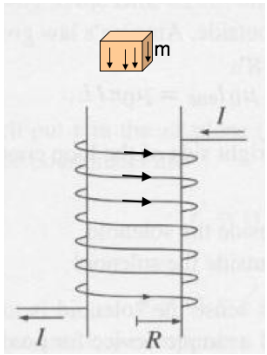
D) Not enough information to answer

E) There is no net force on a dipole

Recall: $\mathbf{F} = \nabla(\mathbf{m} \cdot \mathbf{B})$

A small chunk of material (the “tan cube”) is placed above a solenoid. It magnetizes, weakly, as shown by small arrows inside. What kind of material must the cube be?

A. Dielectric
B. Conductor
C. Diamagnetic
D. Paramagnetic
E. Ferromagnetic



Predict the results of the following experiment: a paramagnetic bar and a diamagnetic bar are pushed inside of a solenoid.

A. The paramagnet is pushed out, the diamagnet is sucked in
B. The diamagnet is pushed out, the paramagnet is sucked in
C. Both are sucked in, but with different force
D. Both are pushed out, but with different force