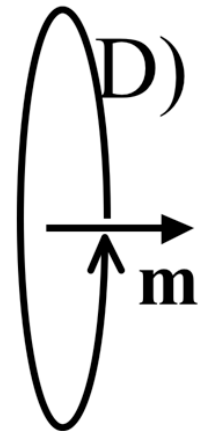
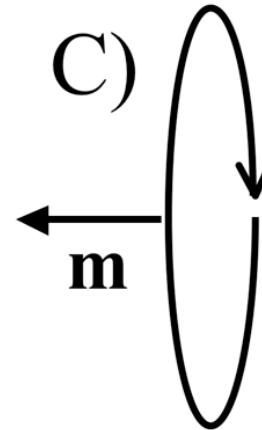
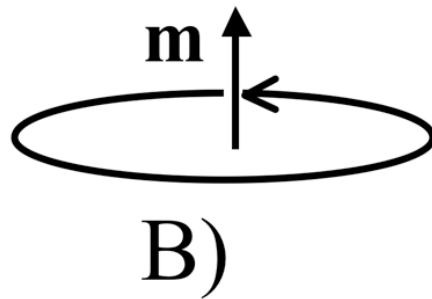
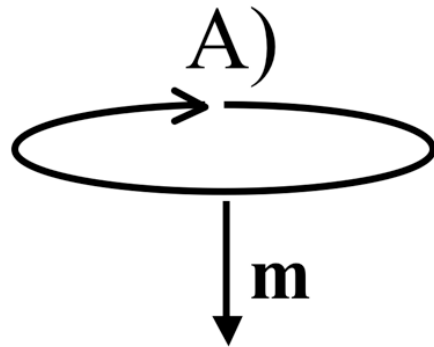


The torque on a magnetic dipole in a B field is:

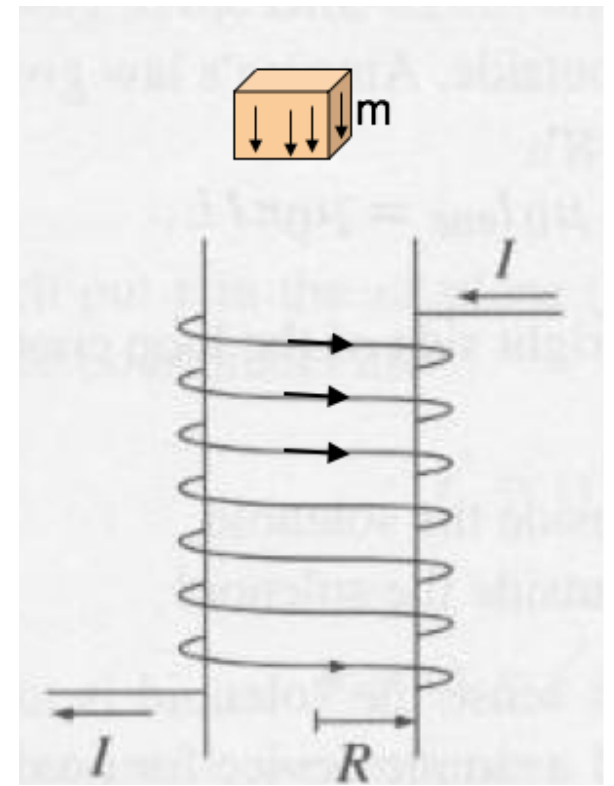
$$\boldsymbol{\tau} = \mathbf{m} \times \mathbf{B}$$

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



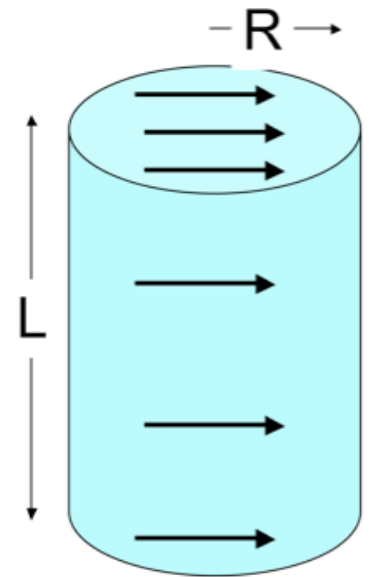
A small chunk of material (the “tan cube”) is placed above a solenoid. It magnetizes, weakly, as shown by small arrows inside. What kind of material must the cube be?

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



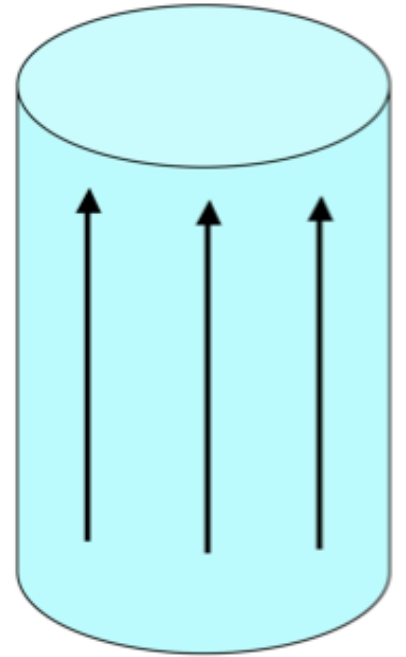
A solid cylinder has uniform magnetization \mathbf{M} throughout the volume in the x direction as shown. What's the magnitude of the total magnetic dipole moment of the cylinder?

- A. $\pi R^2 LM$
- B. $2\pi RLM$
- C. $2\pi RM$
- D. $\pi R^2 M$
- E. Something else/it's complicated!

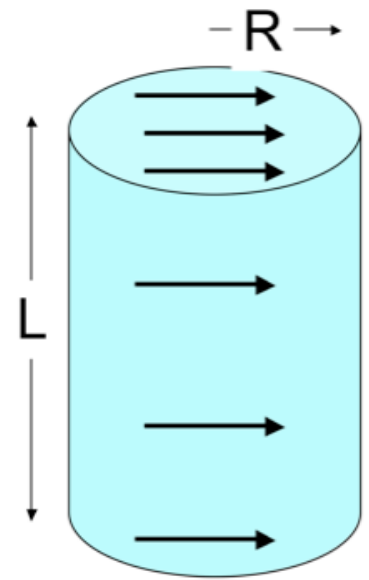


A solid cylinder has uniform magnetization \mathbf{M} throughout the volume in the z direction as shown. Where do bound currents show up?

- A. Everywhere
- B. Volume only, not surface
- C. Top/bottom surface only
- D. Side (rounded) surface only
- E. All surfaces, but not volume



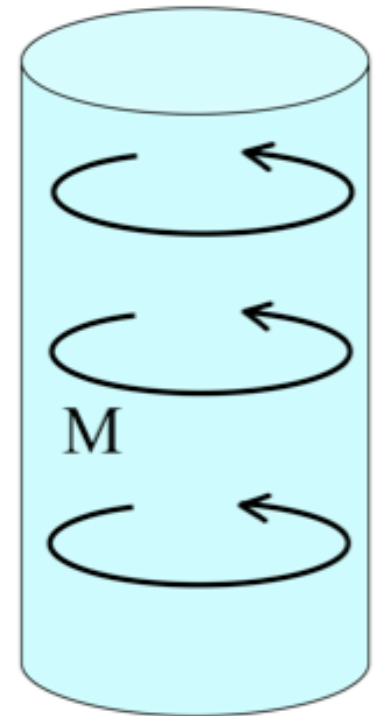
A solid cylinder has uniform magnetization \mathbf{M} throughout the volume in the x direction as shown. Where do bound currents show up?



- A. Top/bottom surface only
- B. Side (rounded) surface only
- C. Everywhere
- D. Top/bottom, and parts of (but not all of) side surface (but not in the volume)
- E. Something different/other combination!

A solid cylinder has uniform magnetization \mathbf{M} throughout the volume in the ϕ direction as shown. In which direction does the bound surface current flow on the (curved) sides?

- A. There is no bound surface current.
- B. The current flows in the $\pm\phi$ direction.
- C. The current flows in the $\pm s$ direction.
- D. The current flows in the $\pm z$ direction.
- E. The direction is more complicated.



A sphere has uniform magnetization \mathbf{M} in the $+z$ direction.
Which formula is correct for this surface current?

- A. $M \sin \theta \hat{\theta}$
- B. $M \sin \theta \hat{\phi}$
- C. $M \cos \phi \hat{\theta}$
- D. $M \cos \phi \hat{\phi}$
- E. Something else

