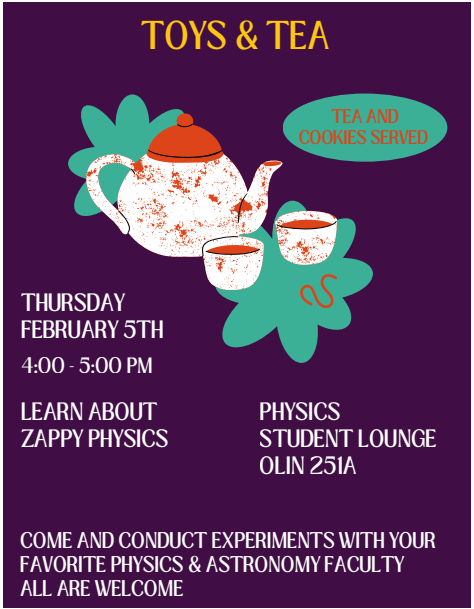
Announcements:

- Interested in evening sessions for MCAT physics preparation? If enough people are interested, I'll arrange a couple of sessions. Email me.
- The first exam will be Thursday, February 12. You will be able to make and bring a 3" $\times$5" card with anything that you want written on it. We will not provide formulas (except for the integrals on the step-by-step sheet), but we will provide constants.



Lecture 5 — Concept Test 1

A magnetic field points straight up towards the ceiling. What is the direction of the magnetic force (or is $F_{\text{mag}} = 0$?) for ...

1. $\uparrow$	**3.** $\rightarrow$	**5.** toward front of room	**back of card** $F = 0$
2. $\downarrow$	**4.** $\leftarrow$	**6.** toward back of room	

(a) an electron sitting motionless on the table?

(b) a proton moving towards the front of the room (towards the chalkboard)?

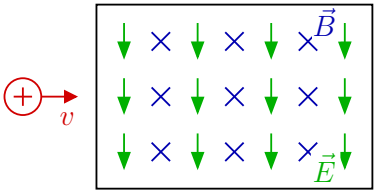
(c) an electron moving towards the front of the room?

(d) proton moving straight up towards the ceiling?

(e) an electron moving to the right (from your perspective)?

Lecture 5 — Concept Test 2

A particle with positive charge q and mass m moves to the right at speed v. It enters a region of uniform $\vec{B}$ field pointing into the screen and uniform $\vec{E}$ field pointing downward, as shown.



Which of the following sketches best shows the path of the particle?

1. 

2.

3. 

4. Not enough info. It depends on the charge q

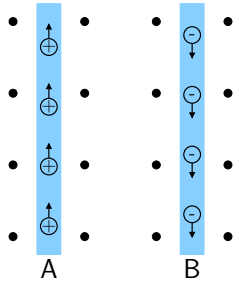
5. Not enough info. It depends on the mass m

6. Not enough info. It depends on the speed v

Lecture 5 — Concept Test 3

Two conductors are located in a uniform magnetic field pointing out of the page. In conductor A, positive charges move upward, while in conductor B negative charges move downward.

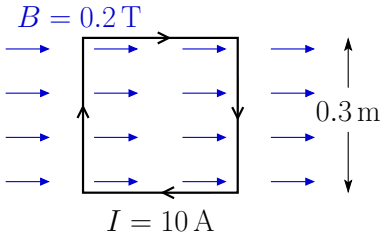
What is the direction of the force on the two conductors?



1. Left for A, right for B
2. Left for A, left for B
3. Right for A, right for B
4. Right for A, left for B
5. Into page for A, out for B
6. The force is zero for both

Lecture 5 — Concept Test 4

For the square loop in the example, what is the direction of the magnetic moment $\vec{\mu}$?



1. $\uparrow$

2. $\longrightarrow$

3. $\downarrow$

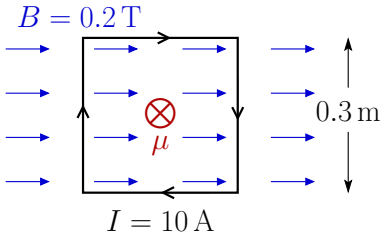
4. $\longleftarrow$

5. $\odot$ (out of screen)

6. $\otimes$ (into screen)

Lecture 5 — Concept Test 5

Continuing . . . We know that the magnetic moment $\vec{\mu}$ points into the screen. What is the direction of the torque acting on the square loop?



1. $\uparrow$

2. $\longrightarrow$

3. $\downarrow$

4. $\longleftarrow$

5. $\odot$ (out of page)

6. $\otimes$ (into page)