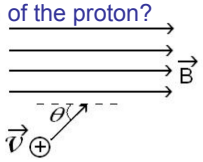
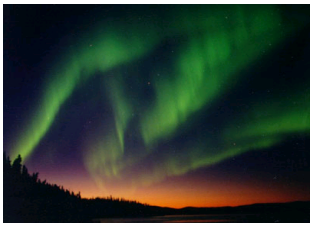
5.3 A proton (speed v) enters a region of uniform **B**. **v** makes an angle θ with **B**.
What is the subsequent path of the proton?

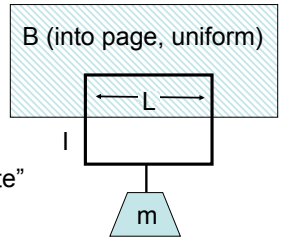


A) Helical
B) Straight line
C) Circular motion, ⊥ page.
(plane of circle is ⊥ **B**)
D) Circular motion ⊥ page.
(plane of circle at angle θ w.r.t. **B**)
E) Impossible. **v** should always be ⊥ **B**



5.4

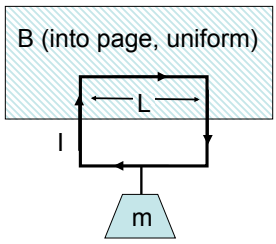
A wire loop in a B field has a current I.
The B-field is localized, it's only in the hatched region, roughly zero elsewhere.
Which way is I flowing to hold the mass in place?



A) CW
B) CCW
C) You cannot "levitate" like this!

5.4

A wire loop in a B field has a current I.
The mass is "levitated" by the magnetic force $F_{mag}=ILB$. If you increase the current , does the magnetic force do positive work on the mass?



A) Yes
B) No

5.5 Positive ions flow right through a liquid, negative ions flow left.
The spatial density and speed of both ions types are identical.
Is there a net current through the liquid?

A) Yes, to the right
B) Yes, to the left
C) No
D) Not enough information given

5.7

Current I flows down a wire (length L) with a square cross section (side *a)*
If it is uniformly distributed over the entire wire area, what is the magnitude of the volume current density *J*?

A) $J = I/a^2$ B) $J = I/a$

C) $J = I/4a$ D) $J = a^2 I$

E) None of the above (Units…!)

5.6

Current I flows down a wire (length L) with a square cross section (side *a)*
If it is uniformly distributed over the outer surfaces only, what is the magnitude of the surface current density *K*?

A) $K = I/a^2$ B) $K = I/a$

C) $K = I/(4a)$ D) $K = aI$

E) None of the above

5.8

A "ribbon" (width a) of surface current flows (with surface current density K)
Right next to it is a second identical ribbon of current.
Viewed collectively, what is the new total surface current density?

5.8

A "ribbon" (width a) of surface current flows (with surface current density K)
Right next to it is a second identical ribbon of current.
Viewed collectively, what is the new total surface current density?

A) K
B) 2K
C) K/2
D) Something else

ERK5-1

A "ribbon" (width a) with uniform surface current density K passes through a uniform magnetic field $\mathbf{B}_{ext}$. Only the length b along the ribbon is in the field. What is the magnitude of the force on the ribbon?

A) KB
B) aKB
C) abKB
D) bKB/a
E) KB/(ab)