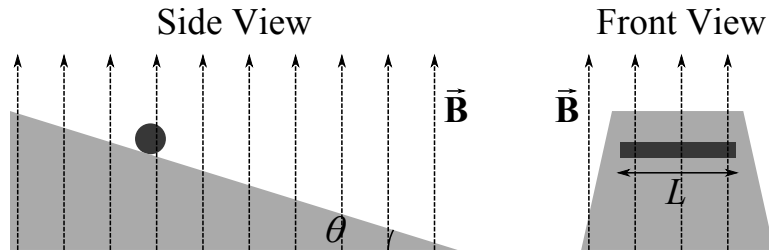


Practical 6 Questions

1. A conducting rod of length L and mass m slides freely down an inclined plane, as shown in the figure. The plane is inclined at an angle θ from the horizontal. A uniform magnetic field of strength B acts in the positive z -direction. Determine the magnitude and the direction of the current that would have to be passed through the rod to hold it in position on the inclined plane.



2. A proton moving at speed v enters a region in space where a magnetic field given by uniform \vec{B} pointed along the negative z -axis. The velocity vector of the proton is at an angle $\theta = 60^\circ$ with respect to the positive z -axis.

- Analyze the motion of the proton and describe its trajectory (in qualitative terms only).
- Calculate the radius, r , of the trajectory projected onto a plane perpendicular to the magnetic field (in the xy -plane).
- Calculate the period, T , and frequency, f , of the motion in that plane.
- Calculate the pitch of the motion (the distance traveled by the proton in the direction of the magnetic field in 1 period).