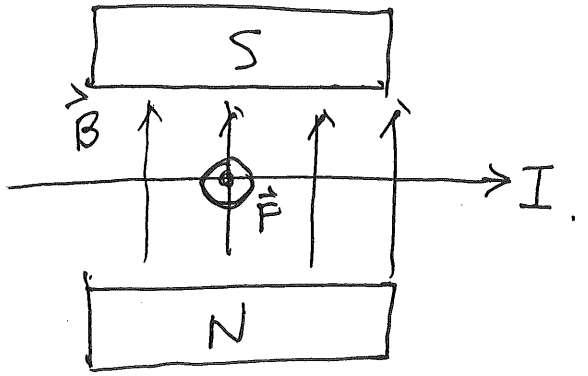
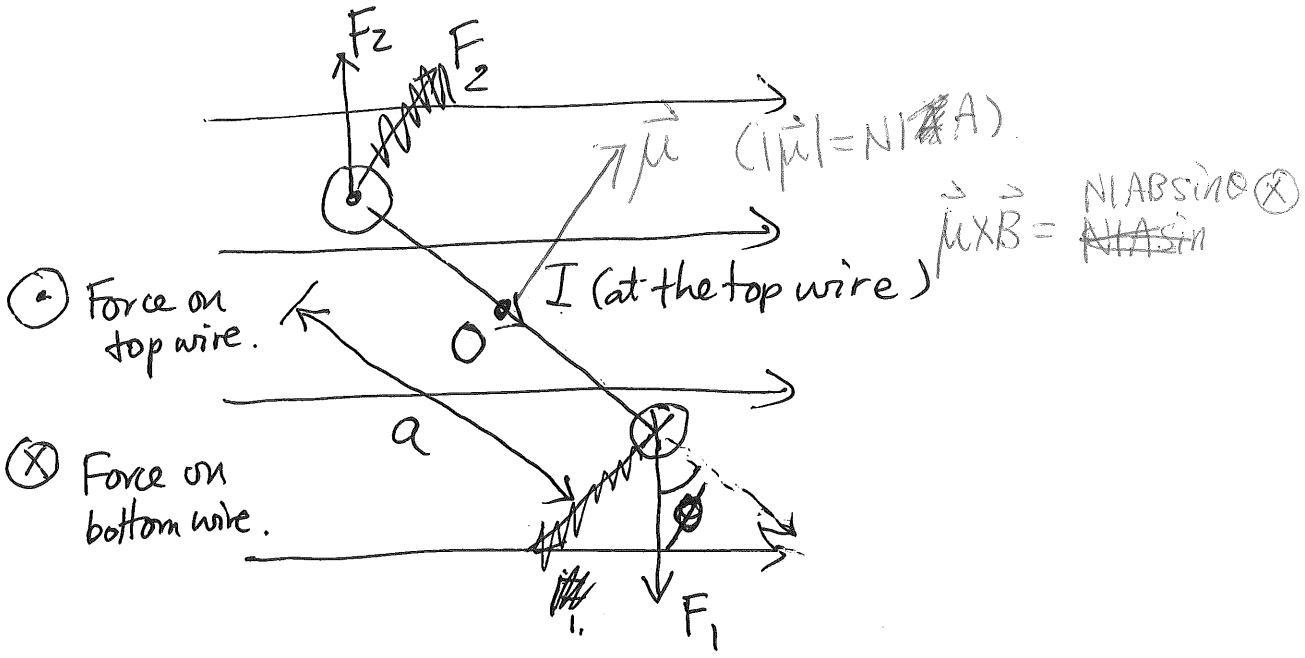


$$d\vec{F} = I\, d\vec{\ell} \times \vec{B}.$$

For a straight current in uniform field $\vec{B}$

$$\vec{F} = I\vec{L} \times \vec{B}.$$



$\vec{F} = 0$ for any loop in a uniform field.

$$d\vec{F} = I\, d\vec{\ell} \times \vec{B}$$

$$\vec{F} = \int I\, d\vec{\ell} \times \vec{B}$$

$$= I\underbrace{\left(\int d\vec{\ell}\right)}_{0} \times \vec{B}$$

$\vec{\tau}$ due to $\vec{F_1} = \vec{r} \times \vec{F}$. $\sin\theta$.

$= \left(\frac{a}{2}\right)(IlB) \otimes$

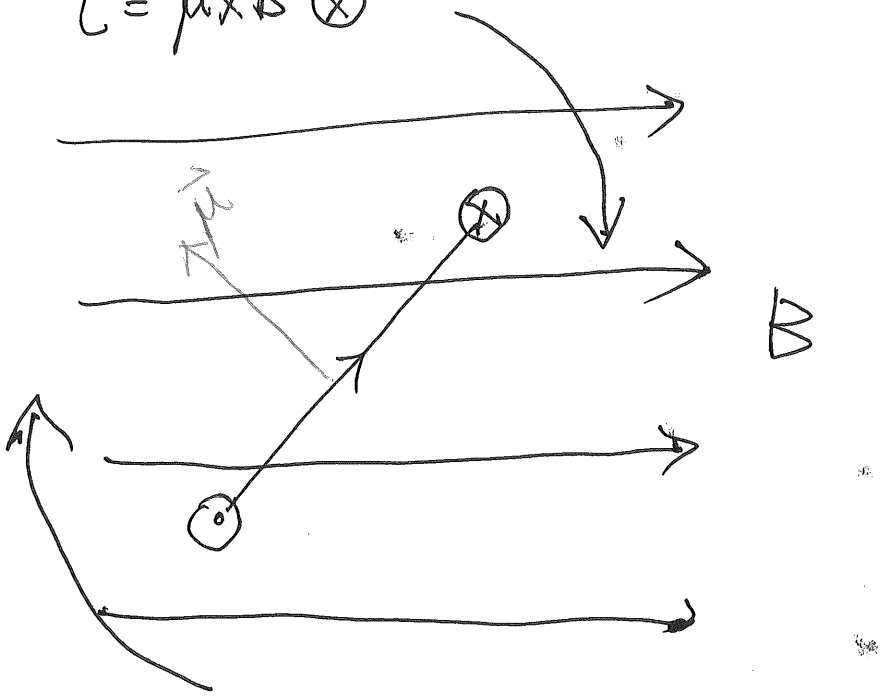
Total torque. $= 2 \times \left(\frac{a}{2}\right)(IlB\sin\phi) \otimes$

$= aIlB\sin\phi \otimes$.

$= IAB\sin\phi \otimes$.

Torque on N loops $= INBA\sin\phi \otimes$

$\vec{\tau} = \vec{\mu} \times \vec{B}$ ⊗



$\vec{\mu} = I\vec{A}$ or $NI\vec{A}$

↑

N loops.