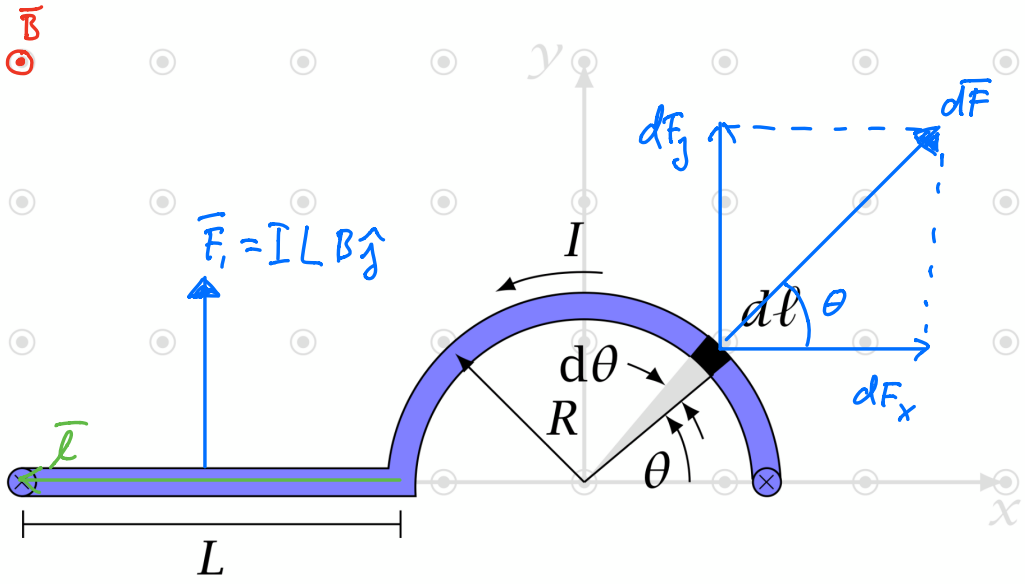


$$dF = I\,d\ell\,B = I R\,d\theta\,B$$

$$dF_x = \cos\theta\, dF$$

$$dF_y = \sin\theta\, dF$$

$$\vec{F}_2 = \int_0^{\pi} \left(dF_x\,\hat{i} + dF_y\,\hat{j}\right)$$

$$= \hat{j} \int_0^{\pi} IRB \sin\theta\, d\theta = \hat{j}\, IRB\left[-\cos\pi + \cos 0\right]$$

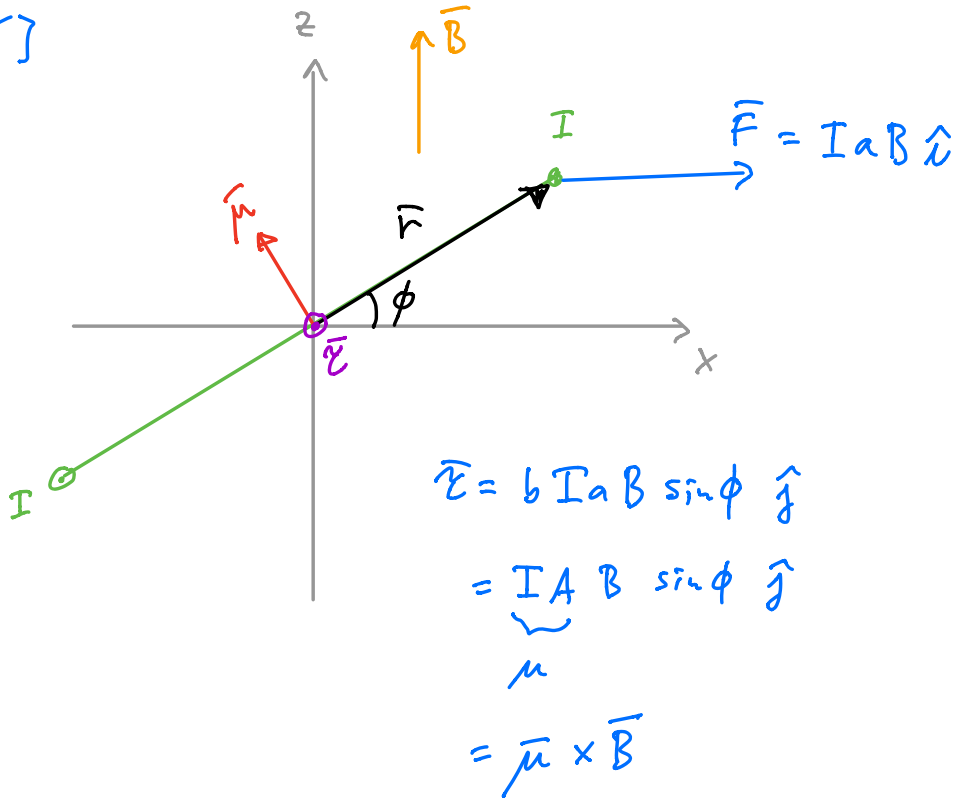
$$= \hat{j}\, 2IRB$$

$$\vec{F} = \vec{F}_1 + \vec{F}_2 = I\left(L + 2R\right)B\,\hat{j}$$

Virtasilmukan
vääntömomentti

[kaava 26]

$$\bar{\tau} = 2\,\bar{r} \times \bar{F} = 2\,\frac{b}{2} F \sin\phi\,\hat{j} = bF\sin\phi\,\hat{j}$$



$$\bar{\tau} = bIaB\sin\phi\,\hat{j}$$

$$= \underbrace{IA}_{\mu} B \sin\phi\,\hat{j}$$

$$= \bar{\mu} \times \bar{B}$$

Yleinen virtasilmukka tasaisessa $\vec{B}$-kentässä [kalvo 23]