

$$dF = I dl B = I R d\theta B$$

$$dF_x = \cos\theta dF$$

$$dF_y = \sin\theta dF$$

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

$$= \hat{j} \int_0^\pi I R B \sin\theta d\theta = \hat{j} I R B [-\cos\pi + \cos 0]$$

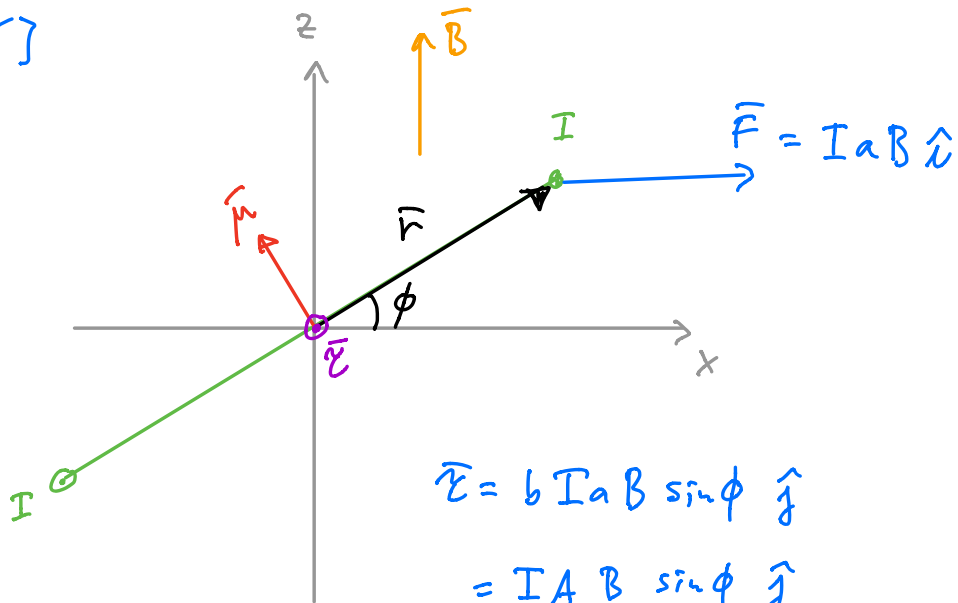
$$= \hat{j} 2 I R B$$

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

Virtasilmukan
vääntömomentti

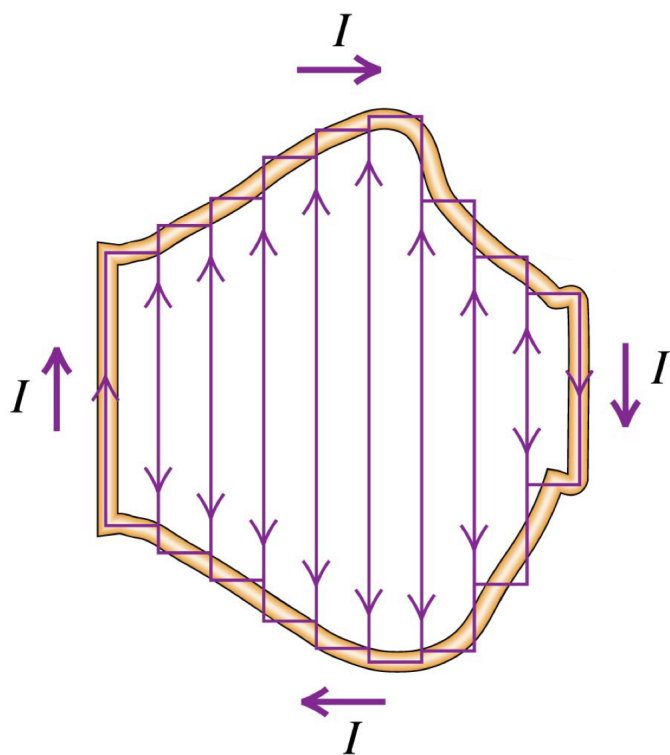
[kalvo 26]

$$\vec{\tau} = \int \vec{r} \times \vec{F} = 2 \frac{b}{2} F \sin \phi \hat{j} = b F \sin \phi \hat{j}$$



$$\begin{aligned}\vec{\tau} &= b I a B \sin \phi \hat{j} \\ &= \underbrace{I A B}_{\mu} \sin \phi \hat{j} \\ &= \vec{\mu} \times \vec{B}\end{aligned}$$

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



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