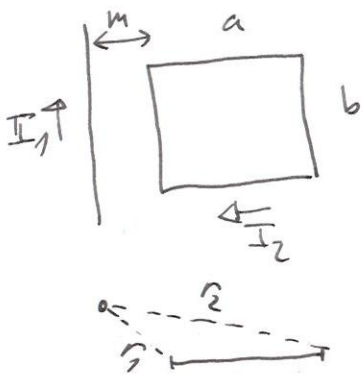
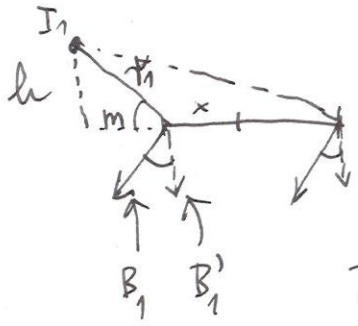
# Kölcsönös indukciós együttható számítása

- fluxus csatolás alapján




- az $I_1$ által keltett mágneses tér

$$B = \frac{\mu_0 I_1}{2\pi \cdot r}$$




$$B_1 = \frac{\mu_0 \cdot I_1}{2\pi \cdot r_1}$$

$$\frac{B_1'}{B_1} = \frac{m}{r_1} \Rightarrow B_1' = \frac{\mu_0 I_1}{2\pi r_1} \cdot \frac{m}{r_1}$$

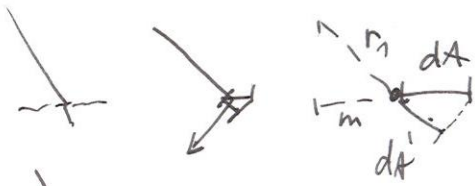
az elforgatott keretre:

$$\Phi = \int_{(2)} \bar{B}\, d\bar{A} = \frac{\mu_0}{2\pi} l \cdot \int_{r_1}^{r_2} B(r) \cdot dr =$$

$$= l \cdot \frac{\mu_0 \cdot I_1}{2\pi} \int_{r_1}^{r_2} \frac{dr}{r} = \boxed{l \cdot \frac{\mu_0 I_1}{2\pi} \cdot \ln \frac{r_2}{r_1}}$$

$$d\Phi = B_1' \cdot dA = B_1 \cdot \frac{m}{r_1} \cdot dA$$

másképpen:




$$\frac{dA'}{dA} = \frac{r_1}{m}$$

$$B_1 \cdot dA' = B_1 \cdot$$

$$r_1 = \sqrt{h^2 + m^2}$$

$$r_2 = \sqrt{h^2 + (m+a)^2}$$

$$\boxed{L_{12} = \frac{\Phi_2}{I_1} = \frac{\mu_0 b}{4\pi} \cdot \ln \frac{m^2 + h^2}{(m+a)^2 + h^2}}$$

1-es 2-es hurok