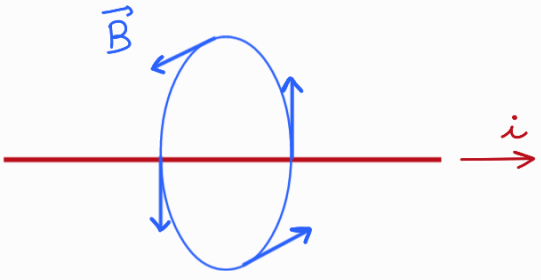
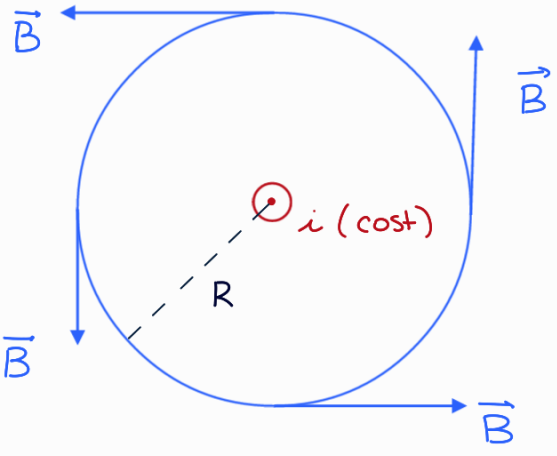
LEGGE DI AMPERE

Prendiamo un filo rettilineo percorso da corrente.

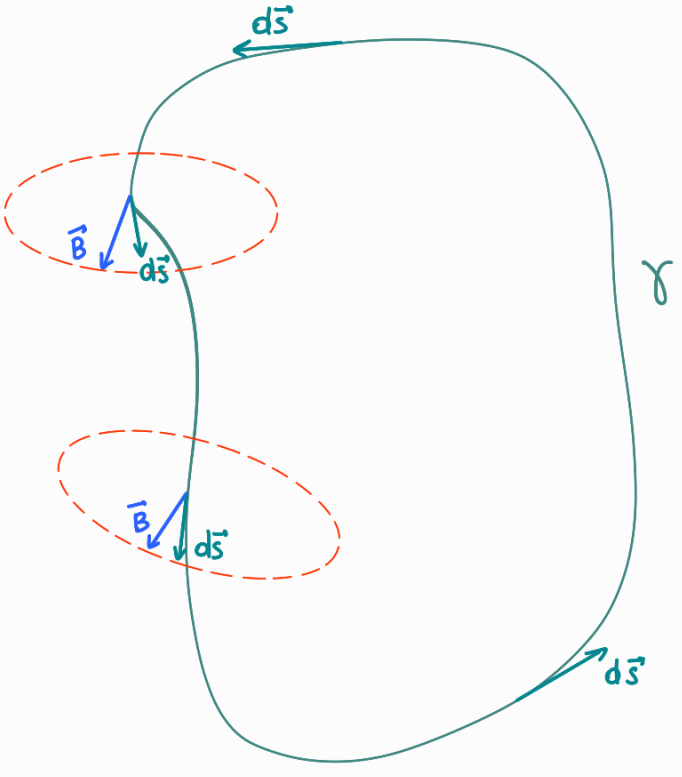
$$B = 2 k_m \frac{i}{R} \qquad \text{con} \quad k_m = 10^{-7} \frac{I}{A} m$$

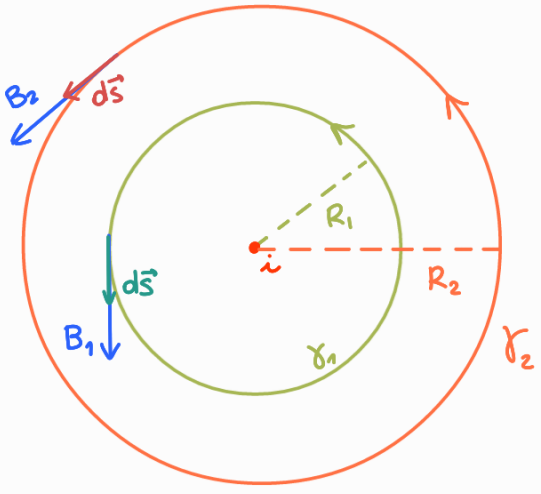




$$\oint_\gamma \vec{B} \cdot d\vec{s}$$

γ: percorso chiuso





$$\oint_{\gamma_1} \vec{B}\cdot d\vec{s} =$$

$$\vec{B}_1 \cdot d\vec{s} = B_1 ds \underbrace{\cos 0}_{=1} = B_1 ds \qquad B_1 = 2k_m \frac{i}{R_1}$$

$$= \oint_{\gamma_1} 2k_m \frac{i}{R_1} ds = 2k_m i \frac{1}{R_1} \oint_{\gamma_1} ds =$$

$$= 2k_m i \frac{1}{R_1} (2\pi R_1) = 4\pi k_m i$$

$$\oint_{\gamma_2} \vec{B}\cdot d\vec{s} = 2k_m i \frac{1}{R_2} \cdot 2\pi R_2 = 4\pi k_m i$$

$$\vec{B}_2 \cdot d\vec{s} = B_2 ds \underbrace{\cos 0}_{=1} = B_2 ds \qquad B_2 = 2k_m \frac{i}{R_2}$$

Quindi $\vec{B}\cdot d\vec{s} = B ds = 2k_m \frac{i}{R} ds = 2k_m i\, d\varphi$ (tratti di arco: $ds = R\, d\varphi$)

$$\Rightarrow \oint_{\gamma} \vec{B}\cdot d\vec{s} = \oint_{\gamma} 2k_m i\, d\varphi = 2k_m i \underbrace{\oint_{\gamma} d\varphi}_{2\pi} = 4\pi k_m i$$