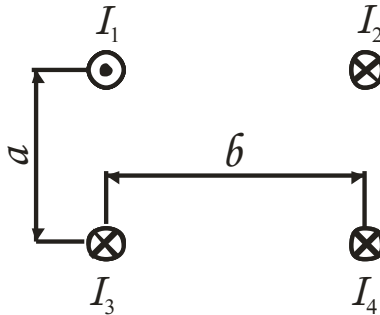
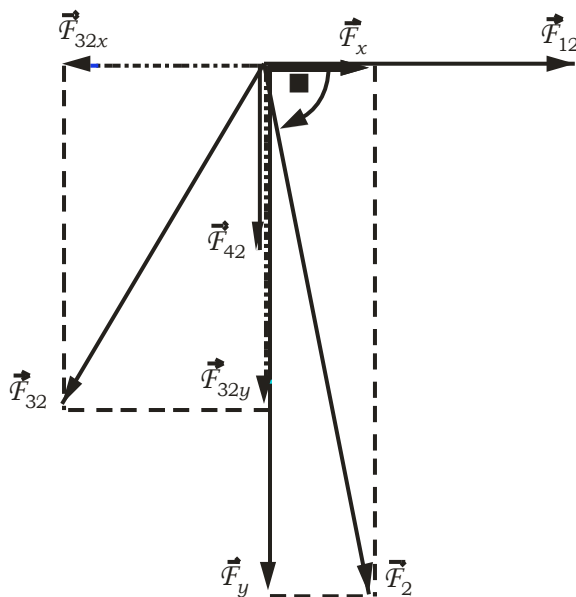


## 8. domaća zadaća iz Osnova elektrotehnike i elektronike

1. Kroz četiri vodiča smještena u zraku kao na slici teku struje  $I_1 = 20$  A,  $I_2 = 30$  A,  $I_3 = 50$  A,  $I_4 = 20$  A. Izračunajte iznos i smjer sile na vodič kojim teče struja  $I_2$ . Udaljenosti između vodiča su  $a = 50$  cm,  $b = 30$  cm.



## Rješenje



$$F_{12} = \mu_0 \cdot \frac{I_1 I_2}{2\pi b} = 4\pi \cdot 10^{-7} \cdot \frac{20 \cdot 30}{2\pi \cdot 0,3} = 400 \frac{\mu\text{N}}{\text{m}}$$

$$F_{42} = \mu_0 \cdot \frac{I_4 I_2}{2\pi a} = 4\pi \cdot 10^{-7} \cdot \frac{20 \cdot 30}{2\pi \cdot 0,5} = 240 \frac{\mu\text{N}}{\text{m}}$$

$$F_{32} = \mu_0 \cdot \frac{I_3 I_2}{2\pi \sqrt{a^2 + b^2}} = 4\pi \cdot 10^{-7} \cdot \frac{50 \cdot 30}{2\pi \cdot 0,5831} =$$

$$F_{32} = 514,5 \frac{\mu\text{N}}{\text{m}}$$

$$F_{32x} = \frac{b}{\sqrt{a^2 + b^2}} \cdot F_{32} = 264,7 \frac{\mu\text{N}}{\text{m}}$$

$$F_{32y} = \frac{a}{\sqrt{a^2 + b^2}} \cdot F_{32} = 441,2 \frac{\mu\text{N}}{\text{m}}$$

$$F_x = F_{12} - F_{32x} = 135,3 \frac{\mu\text{N}}{\text{m}}$$

$$F_y = F_{42} + F_{32y} = 681,2 \frac{\mu\text{N}}{\text{m}}$$

$$F_2 = \sqrt{F_x^2 + F_y^2} = 694,5 \frac{\mu\text{N}}{\text{m}}$$

$$\varphi = -\arctg \frac{F_y}{F_x} = 78,77^\circ$$