

26. Using Eq. 30-15, the force on, say, wire 1 (the wire at the upper left of the figure) is along the diagonal (pointing towards wire 3 which is at the lower right). Only the forces (or their components) along the diagonal direction contribute. With  $\theta = 45^\circ$ , we find

$$\begin{aligned} F_1 &= \left| \vec{F}_{12} + \vec{F}_{13} + \vec{F}_{14} \right| \\ &= 2F_{12} \cos \theta + F_{13} \\ &= 2 \left( \frac{\mu_0 i^2}{2\pi a} \right) \cos 45^\circ + \frac{\mu_0 i^2}{2\sqrt{2}\pi a} \\ &= 0.338 \left( \frac{\mu_0 i^2}{a} \right) . \end{aligned}$$