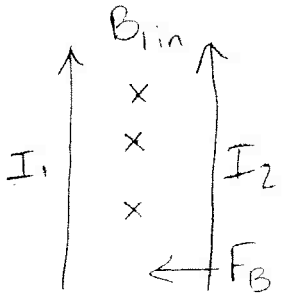
P #44

Ch 19 - pg 616

a) $r = .10\,m$
$I_1 = I_2 = 10.0\,A$



B_1 at $I_2 = \frac{\mu_0 \cdot I_1}{2 \cdot \pi \cdot r}$

F_B at $I_2 = B_1 I_2 \cdot l \cdot \sin 90$

$\frac{F_B}{l} = B_1 \cdot I_2$

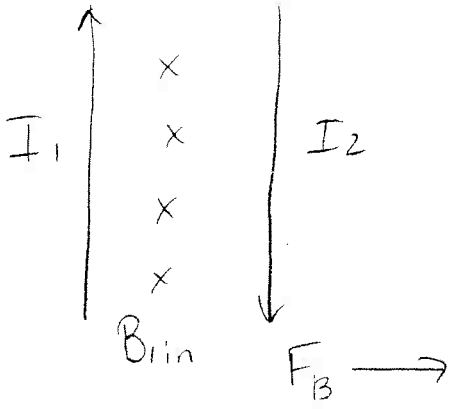
$= \left(\frac{\mu_0 \cdot I_1}{2 \cdot \pi \cdot r}\right) \cdot I_2$

$= \frac{\mu_0 (10\,A)(10\,A)}{2 \cdot \pi (.10\,m)}$

By RHR #2:
B_1 = in
By RHR #1:
F_B = left

$F_B/l = 2.0 \times 10^{-4}\ N/m$
(attract)

b) Magnitude remains constant



$F_B/l = 2.0 \times 10^{-4}\ N/m$
(repel)

By RHR #2:
B_1 = in

By RHR #1:
F_B = right