Ch, 11 Prob. 38

$I = 30.A$

$F = 2.16\,N$

$\ell = 4.00\,cm = 4.0\times10^{-2}\,m$

Find the average field strength.

$\vec{F} = I\vec{\ell} \times \vec{B}$

Magnitude of the force is

$F = I\ell B \sin\theta$

since B & ℓ are perpendicular

$\theta = 90$

and $F = I\ell B$

solving for B gives

$$B = \frac{F}{I\ell} = \frac{2.16\,N}{(30.0A)(4.0\times10^{-2}\,m)}$$

$B = 1.8\,T$