Homeworks
Nasser Alrasbi

S.1

$\vec{F}_e = -e\vec{v}\times\vec{B}$ per electron in wire cross Section A and alength dL

- I assume that $\vec{v}$ is in direction along the wire and the wire and $\vec{B}$ field make an ~~an~~ angle θ

$$f_e = -evB\sin\theta = \frac{\text{force}}{\text{electron}}$$

$$f_{dL} = \left(\frac{\text{force}}{\text{electron}}\right)\left(\frac{\text{electron}}{\text{volume}}\right)(\text{volume})$$

$$f_{dL} = (-evB\sin\theta)(n)(A\,dL)$$

$I = nAvq$

$q = -e$

$\therefore I = nAv(-e)$

$I = -enAv$

$\therefore \boxed{f_{dL} = IB\,dL\sin\theta}$

The magnetic field exerts a force on the electrons in the wire. while the electrons are free to move inside of conductor, and the nulei are fixed. The electrons are pushing by magnetic force and they drag the nuclei of the wire with them via the electric force. This will be in the same direction to lrd the wire being pushed by the electrons.