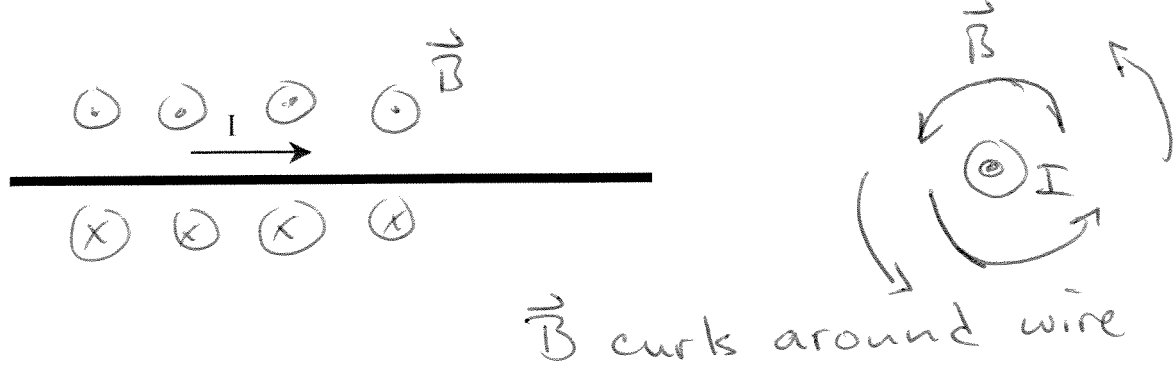


# Physics 161 Quiz – Magnetic Fields and Force

Name KEY  
 Lab Time \_\_\_\_\_

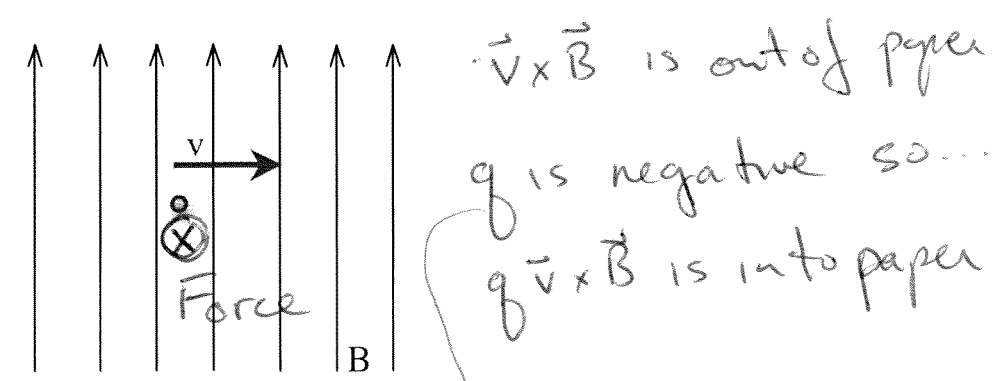
1. [3 PTS] Draw the magnetic field produced by a current carrying wire.



2. [2 PTS] What is the magnitude of the resulting magnetic field,  $\vec{B}$ , 2 cm from the center of a wire carrying a 0.5 A current.

$$|\vec{B}| = \frac{\mu_0 I}{2\pi r} = \frac{4\pi \times 10^{-7} \frac{Tm}{A} (0.5 A)}{2\pi (2 \times 10^{-2} m)} = \frac{1}{2} \times 10^{-5} T = 0.5 \times 10^{-5} T = 5 \mu T$$

3. [3 PTS] Draw the direction of the force for the electron moving through the uniform  $\vec{B}$  below.



4. [2 PTS] What is the magnitude of the force? (define the symbols used)

$$\vec{F} = q(\vec{v} \times \vec{B})$$

$q$  = charge ( $-1.602 \times 10^{-19} C$ )  
 $\vec{v}$  = velocity of  $e^-$   
 $\vec{B}$  = magnetic field