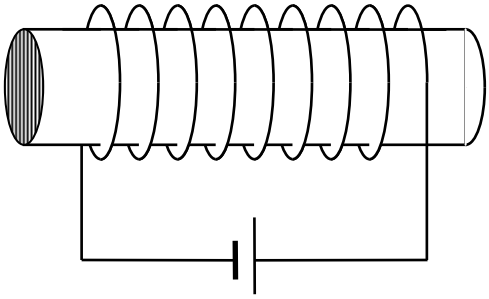
PHYSICS 12 MAGNETIC FIELDS WORKSHEET 1

Unless otherwise stated, assume conventional current.

1. Examine the solenoid circuit to the right.



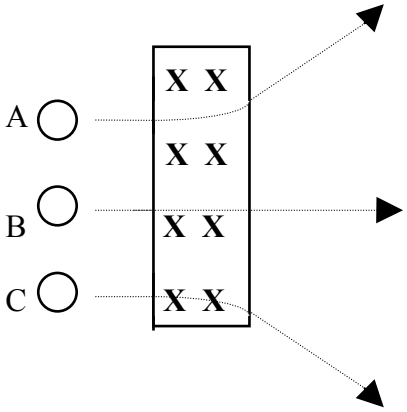
   a) Use arrows to indicate the direction of conventional current flow in the wires and through the solenoid.
   b) Indicate the end of the solenoid which is "north".
   c) Draw a complete magnetic field line and indicate its direction.

2. What is the magnetic field strength at the center of a solenoid which has 2500 turns of wire, is 25 cm long, and has a current of 3.6 A running through it?

3. A solenoid with 5.2 A of current through it has a magnetic field of 0.35 T at its center. How many turns per meter does this solenoid contain?

4. The magnetic field through the center of a certain solenoid is 0.75 T. If the solenoid consists of 1880 windings per cm, what is the current through the solenoid?

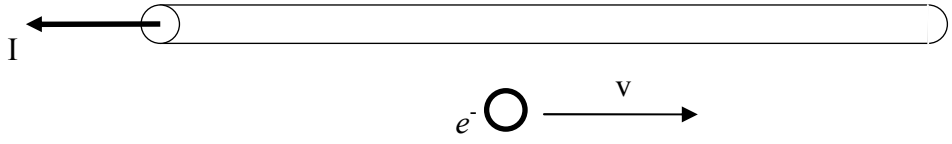
5.



Describe the charge of each particle. The magnetic field within the rectangle is directed into the page.

6. An electron travelling at 4.4×10^4 m/s moves at right angles through a magnetic field of strength 6.8 T. What force acts on the electron?

7. On the diagrams below, sketch the direction of the magnetic force acting on the electron, moving in the direction shown relative to the current-carrying wire.



8. An electron moving *south* through a magnetic field experiences no magnetic force. Another electron moving *west* at 5.6×10^{6} m/s through the same field is acted upon by an *out-of-page* magnetic force of 8.4×10^{-14} N. What is the magnitude and direction of the field?

*9. A proton enters a magnetic field of flux density 1.5 T with a velocity of 2.0×10^{7} m/s at an angle of 30° with the field. Compute the force on the proton.

1. b) left side is **N** 2. 4.5×10^{-2} T 3. 5.4×10^{4} turns/m 4. 3.2 A 6. 4.8×10^{-14} N 7. up, towards the wire
8. 9.4×10^{-2} T, due north 9. 2.4×10^{-12} N