Electromagnetic Forces

For questions #1 thru #3 use the Magnetic Force equation to solve the problems. Please show equation, substitution and answer with correct units for full credit.

1. What is the maximum force on an aluminum rod with a 0.000005-C charge that you pass between the poles of a 1.50-T permanent magnet at a speed of 5.00 m/s?
2. A charge of 3.60 x 10-6 C moves through a magnetic field of 1.5 T at 862 m/s.
3. What would the force be on the charge if it was moving in the same direction as the magnetic field?
4. What would the force acting on the charge be if it was moving at right angle with the magnetic field?
5. In a television set, electrons travel at a velocity of 6.0 x 107 m/s. A strong magnet moved near the television set exerts a force of 6.2 x 10-12 N on a single electron, distorting the picture. Calculate the strength of the magnetic field. (Charge of an electron is -1.6 x 10-19 C)

For questions #4 thu #6 use the correct equation to solve the problem. Show the correct equation, substitution, and answer with correct units. Remember to use your notes for help.

1. What is the magnetic Field strength at the center of a solenoid that has 100 loops and a current of 1.5 amps.
2. A circular wire loop with a 0.25 m radius is in a constant magnetic field **B** whose magnitude is 0.5 T. Find the magnetic Flux through the loop when it’s at
   1. 90 degrees
   2. 30 degrees
   3. 0 degrees
3. In your own words describe the right hand rule (RHR). Use pictures and visuals to help you.