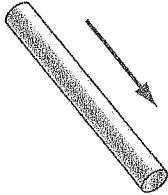# R.H.R. #1 Homework

1. Copy the following images into your notebook. For each current carrying conductor, sketch a view of the magnetic field, based on the direction of current flow shown.
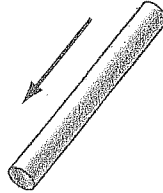
a) Fig.9.21a   **b) Fig.9.21b**   **c) Fig.9.21c**   **d) Fig.9.21d**   **e) Fig.9.21e**
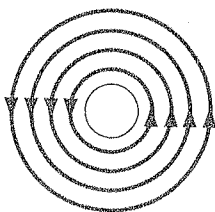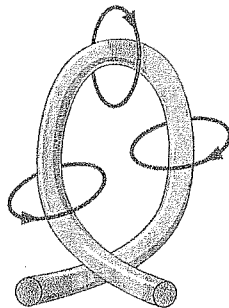

2. Copy the following images into your notebook. For each current-carrying conductor, show the direction of current flow, based on the structure of the magnetic field shown.
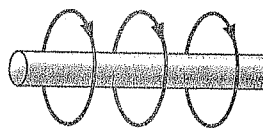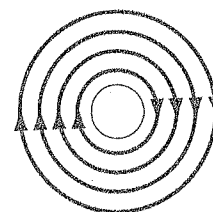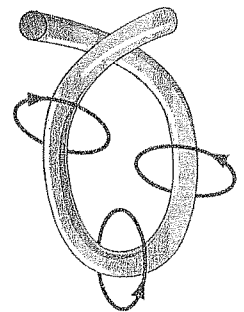
a) Fig.9.22a   **b) Fig.9.22b**   **c) Fig.9.22c**   **d) Fig.9.22d**   **e) Fig.9.22e**

3. What is the magnetic field strength 20 cm from a long, straight conductor with a current of 60 A flowing through it? $(6.0 \times 10^{-5}$ T)

4. What current is flowing through a straight wire if the magnetic field strength 10 cm from the wire is 2.4×10^{-5} T? (12 A)

5. At what distance from a straight conductor, with a current of 200 A flowing through it, is the magnetic field intensity 8.0×10^{-4} T? $(5.0 \times 10^{-2}$ m)

6. What is the magnetic field strength at a point midway between two long, parallel wires, 1.0 m apart, carrying currents of 10 A and 20 A respectively, if the currents are
   a) in opposite directions? $(1.2 \times 10^{-5}$ T)
   b) in the same direction? $(4.0 \times 10^{-6}$ T)

7. A long, solid, copper rod has a circular cross-section of radius 5.0 cm. It carries a current of 1000 A, uniformly distributed across its area. Calculate the magnetic field strength at these four positions:
   a) at the centre of the rod. (0 T)
   b) 2.5 cm from the centre. $(2.0 \times 10^{-3}$ T)
   c) 5.0 cm from the centre. $(4.0 \times 10^{-3}$ T)
   d) 7.5 cm from the centre. $(2.7 \times 10^{-3}$ T)

   Hint: Remember, the current in Ampere's Law is the current flowing through the enclosed area.