

Work each of the following problems. SHOW ALL WORK.

1. Faraday's law of magnetic induction states that the voltage produced by a current running through a wire is directly related to the number of loops in the wire and the cross-sectional area of the wire. If the number of loops and the area are both doubled, by what factor will the voltage increase?

2. What is the magnetic force experienced by 0.50 m of wire that carries 3 A of current and is exposed to a 1.2 T magnetic field?
3. The magnetic force acting on a current-carrying wire is 5 N. Calculate the length of the wire if it is carrying 2 A of current in a 0.10 T magnetic field.
4. A magnetic field of 0.50 T is applied at a right angle to a coil with 20 turns of wire wrapped around a tube with a cross-sectional area of 1 m^2 . If the coil is pulled out of the magnetic field in 5 seconds, what emf is induced in the coil?

