

Work each of the following problems. SHOW ALL WORK.

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

2. What is the magnetic force that 0.50 m of a current-carrying wire experiences as 3.0 A of current pass through when it is exposed to a 1.2 T magnetic field?
3. The magnetic force acting on a current carrying wire is 5.0 N. What must the length of wire be if there is 2.0 A of current flowing through and it is placed in a 0.10 T magnetic field?
4. A coil with 20 turns of wire is wrapped around a tube with a cross-sectional area of 1.0 m². A magnetic field is applied at a right angle at 0.50 T. If the coil is pulled out of the magnetic field in 5 seconds, what emf is induced in the coil?

