

Problems

20.1 Magnetic Fields, Field Lines, and Force 18.

A straight wire segment carries 0.25 A. What length would it need to be to exert a 4.0-mN force on a magnet that produces a uniform magnetic field of 0.015 T that is perpendicular to the wire?

- a. 0.55 m
- b. 1.1 m
- c. 2.2 m
- d. 4.4 m

20.3 Electromagnetic Induction 19.

What is the current in a wire loop of resistance $10\ \Omega$ through which the magnetic flux changes from zero to 10 Wb in 1.0 s?

- a. -100 A
- b. -2.0 A
- c. -1.0 A
- d. +1.0 A

20.

An emf is induced by rotating a 1,000 turn, 20.0 cm diameter coil in Earth's 5.00×10^{-5} T magnetic field. What average emf is induced, given the plane of the coil is originally perpendicular to Earth's field and is rotated to be parallel to the field in 10.0 ms?

- a. -1.6×10^{-4} V
- b. $+1.6 \times 10^{-4}$ V
- c. $+1.6 \times 10^{-1}$ V
- d. -1.6×10^{-1} V