

In order to get an idea of the magnitude of magnetic forces, find the force per unit length between very long equal and opposite 10 ampere currents separated by 1 centimeter. Find the ratio of this to the weight per unit length of the copper wire described in Exercise 12-17.

12-17 A copper wire 2.5 millimeters in diameter is carrying a current of 10 amperes. Assume one free electron per copper atom and find the magnitude of the drift velocity. [Copper has a density of 8.92 grams/(centimeter)<sup>3</sup>, an atomic weight of

63.5 grams/mole, and Avogadro's number is  $6.02 \times 10^{23}$ /mole.]