**Problems Chapter 1**

A cubic box has a side of length 1.00 ft. What is the volume of the box in m3? (1 ft = 12.0 in, 1 in = 2.54 cm)

Assume it takes 6.00 minutes to fill a 30.0-gallon tank. Calculate the rate at which the tank is filled in cubic meters per second. [1 gallon = 231 in3, 1 in = 2.54 cm]

When a large object moves in air, there is a resistive force on it whose magnitude is given by: F = 0.5 D ρ B v2, where D is a dimensionless constant, ρ is the density of the air and v is the speed of the object. What are the dimensions of B?

Van der Wall’s equation of state for gases is given by (P+ a/V2) (V- b) = RT Where, P is the pressure, V is the volume and T is the temperature (K). a, b, and R are constants. The dimension of “a” is

The velocity of a particle is time dependent and is given by the equation: v = At2 + B/A. Where, t is time and A and B are unknown quantities. Find the dimension of B?