

54. Although the object in question is a sphere, the area  $A$  in Eq. 6-16 is the cross sectional area presented by the object as it moves through the air (the cross section is perpendicular to  $\vec{v}$ ). Thus,  $A$  is that of a circle:  $A = \pi R^2$ . We also note that 16 lb equates to an SI weight of 71 N. Thus,

$$v_t = \sqrt{\frac{2F_g}{C\rho\pi R^2}} \implies R = \frac{1}{145} \sqrt{\frac{2(71)}{(0.49)(1.2)\pi}}$$

which yields a diameter of  $2R = 0.12$  m.