

# 15

# Fluids and Elasticity

## 15.1 Fluids

1. An object has density  $\rho$ .
  - a. Suppose each of the object's three dimensions is increased by a factor of 2 without changing the material of which the object is made. Will the density change? If so, by what factor? Explain.
  
  
  
  
  
  
  
  
  
  
  - b. Suppose each of the object's three dimensions is increased by a factor of 2 without changing the object's mass. Will the density change? If so, by what factor? Explain.
  
  
  
  
  
  
  
  
  
  
2. Air enclosed in a cylinder has density  $\rho = 1.4 \text{ kg/m}^3$ .
  - a. What will be the density of the air if the length of the cylinder is doubled while the radius is unchanged?
  
  
  
  
  
  
  
  
  
  
  - b. What will be the density of the air if the radius of the cylinder is halved while the length is unchanged?
  
  
  
  
  
  
  
  
  
  
3. Air enclosed in a sphere has density  $\rho = 1.4 \text{ kg/m}^3$ . What will the density be if the radius of the sphere is halved?