

Density Problems

1. What is the volume of a tank that can hold 18 754 Kg of methanol whose density is 0.788g/cm^3 ?
2. What is the density of a board whose dimensions are 5.54 cm x 10.6 cm X 199 cm and whose mass is 28.6 Kg?
3. CaCl_2 is used as a de-icer on roads in the winter. It has a density of 2.50 g/cm^3 . What is the mass of 15.0 L this substance?
4. In the Macy's Thanksgiving day parade, 2000, there was a new float, the Cheerios' bee, Buzzbee. The jar of honey it was holding contained 36,763 L of helium. The honey jar was 1/10 of the body size. What is the volume of the entire float? If the density of helium is 0.000178 g/cm^3 , what is the mass of the helium for the entire float in Kg?
5. My gas tank in my car has a total volume of 68 L. The manual says the gas gauge light will come on when there are only 5 L remaining in the tank and that the car will not be able to draw on the last 2 L in the tank. Practically speaking, what is the functional volume of the gas tank? If I ran out of gas, the car won't go, and I put in 5 L of gas, what is the total volume of gas in my tank? If 5 L of gas has a mass of 450 Kg, what is the mass of the gas in my tank? What is the density of the gas?
6. The density of paper is 1.20 g/cm^3 . What is the mass of the paper in a notebook that is 76 mm thick, 215.9 mm wide, and 279.4mm long?
7. In pottery class, you throw a pot from a lump of wet clay. Your pot's mass is 5.5 Kg. After the pot is fired, its mass is 4.9 Kg. The density of wet clay is 1.60 g/cm^3 and the density of fired clay is 1.36 g/cm^3 . What was the volume of your pot before it was fired? What was the volume of the pot after it was fired?
8. The Italian government is giving Michelangelo's David a bath. In the newspaper, there was a photo of a person working on the statue. Their hand was half the size of the statue's hand. If the statue is 4.9m^3 and the density of marble is 2.76 g/cm^3 what is the mass?
9. The volume of the aquarium in our classroom is 1890 L. The density of seawater is 1.03g/cm^3 . What is the mass of the water in our tank?
10. Spanish mahogany is a red, lustrous wood. It is prized over Honduras mahogany, which does have the characteristic red color and similar grain, but is the wood is not as compact and has a looser appearance than the Spanish mahogany. A hope chest made of Honduras mahogany has a volume of $.648\text{ m}^3$ and a mass of 349 Kg. An identical hope chest made of Spanish mahogany has a mass of 550.8 Kg. What is the density of Honduras mahogany? What is the density of Spanish mahogany?

Answers: 1) $23,799,492.4\text{ cm}^3$ 2) $.00245\text{ kg/cm}^3$ 3) 37,500 g 4) $v = 367,630\text{ L He}$; $m = 65.4\text{ Kg}$ 5) functional volume of tank is 68L - 2 L = 66 L gas; "empty tank" + 5 L = 7 L gas; 630 kg; 90 kg/L 6) 5501.4 g 7) 3437.5 cm^3 ; 3602.9 cm^3 8) 13,524,000 g 9) 1,946,700 g 10) 538.6 kg/m^3 ; 850 kg/m^3