

Density: Show ALL work using dimensional analysis.

1. If an unknown solid weighs 84.0 grams and occupies 30.0 cm³ of space, what is its density?
2. What is the mass, in grams, of a liquid having a density of 1.50 g/ml and a volume of 3.5 liters?
3. What is the volume of a 200.0 gram sample of gold if its density is known to be 20.5 g/cm³?
4. A solid block of substance is 74.0 cm by 55.0 cm by 29.0 cm and it weighs 625 kg. Determine the density. Would it float in water? The density of water is 1 g/cm³
5. A gas has a volume of 7.0 liters and a mass of 444 grams. What is its density?
6. A certain liquid has a density of 0.855 g/mL. If the mass of a sample of the liquid 1.00 kg what is the volume in mL?
7. What is the volume, in L, of 100. grams of mercury? Mercury has a density of 13.54 g/mL
8. The density of a solid is 2.88 g/cm³ The dimensions are 3.2 cm by 1.8 cm by 3.0 cm. What is the mass of the solid?
9. An irregularly-shaped solid is placed into a graduated cylinder filled with 25.8 mL of water and the level of the water rises to 33.9 mL. The mass is 5.88 g. What is the density of this solid?
10. A 35-mL sample of a liquid has a mass of 42.40 g. (a) What is its density? Will it sink or float in water
The largest ruby in the world is 10.9 cm long, 9.10 cm wide, and 5.80 cm thick, giving it an overall volume of 575 cm³ If the density of ruby—a form of aluminum oxide—is 3.97 g/cm³ what is the mass of the largest ruby?
11. Gasoline, which is a mixture of several hydrocarbon compounds, has one of the lowest densities of any liquid. Given that 0.70 g/cm³ is the density of gasoline, determine the volume of 2.77 kg of gasoline.
12. Outer space is often described as a vacuum, but there is always some matter present. In the space 300 km above Earth's surface, there is as little as 1.58×10^{-12} g of matter in a 500.0 cm³ volume of space. Based on this data, what is the density of the matter in space?
13. The volume of a liquid that fills a flask is 750 cm³ The mass of the liquid is 525 g. What is the liquid's density? Is it most likely to be water (D = 1.0 g/cm³), gasoline (D= 0.70 g/cm³), or ethanol (D = 0.79 g/cm³)?
14. Because inland seas like the Caspian Sea or the Great Salt Lake evaporate faster than they can be refilled, they have higher concentrations of salts than oceans have. The highest concentration of salts in any body of water is found in the Dead Sea, in Israel. If you had 1230 cm³ of this water, which has a density of 1.22 g/cm³, what would be its mass?