# Density

Please answer all questions as completely as possible showing all calculation and work needed.  Also don't forget to include your units!

$$Density \;=\; \frac{Mass}{Volume}$$

1) Rearrange the density equation for the following:

      Mass =                               Volume =

2) Calculate the density of a material that has a mass of 52.457 g and a volume of 13.5 $cm^3$.

3) The density of silver is 10.49 $g/cm^3$.  If a sample of pure silver has a volume of 12.993 $cm^3$, what is the mass?

4) The density of lead is 11.342 g/mL.  What would be the volume of a 200.0 g sample of this metal?

5) An irregularly shaped stone was lowered into a graduated cylinder holding a volume of water equal to 2 ml. The height of the water rose to 7 ml. If the mass of the stone was 25 g, what was its density?

6) Silver has a density of 10.5 grams/$cm^3$ and gold has a density of 19.3 $g/cm^3$. Which would have the greater mass, 5$cm^3$ of silver or 5$cm^3$ of gold?

7) Five mL of ethanol has a mass of 3.9 g, and 5.0 mL of benzene has a mass of 44 g. Which liquid is denser?  Calculate both densities to show your work.

8) A sample of iron has the same dimensions of 2 cm x 3 cm x 2 cm. If the mass of this rectangular-shaped object is 94 g, what is the density of iron?

9) Use the data below to determine the substance and complete the chart.

| Mass (g) | Volume ($cm^3$) | Density ($g/cm^3$) | Substance |
|---|---|---|---|
| 4725 | 350 | 13.5 | mercury |
| 680 | 1000 | | |
| 106 | 40 | | |
| 475 | 250 | | |
| 171 | 15 | | |

| Substance | Density ($g/cm^3$) |
|---|---|
| Gold | 19.3 |
| Mercury | 13.5 |
| Lead | 11.4 |
| Iron | 7.87 |
| Aluminum | 2.7 |
| Bone | 1.7-2.0 |
| Gasoline | 0.66-0.69 |
| Air (dry) | 0.00119 |

10) How many grams of dry air are in a small, empty closet that has a volume of 3.29 $m^3$, which converts to 3290000 $cm^3$?

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