

Name _____

Date _____

Period _____

Homework – Density

1. a man has a 50.0 cm^3 bottle completely filled with 163 g of a slimy green liquid. What is the density of the liquid?

2. A piece of metal has a volume of 6.7 cm^3 and a mass of 75.7g. Find the metal's density.

3. The mass of a 125 cm^3 piece of material is 83.75 g. Determine the density of this material.

4. What is the volume of 325g of metal with a density of 9.0 g/cm^3

5. Diamonds have a density of 3.5 g/cm^3 . How big is a diamond that has a mass of 0.10g?

Math Skills

Density

After you study each sample problem and solution, work out the practice problems on a separate sheet of paper. Write your answers in the spaces provided.

PROBLEM

The largest meteorite discovered on Earth is the Hoba West stone in Namibia, Africa. The volume of the stone is about 7.5 m^3 . If the meteorite has a density of 8.0 g/cm^3 , what is its mass?

SOLUTION

Step 1: List the given and the unknown values.

Given: *volume*, $V = 7.5 \text{ m}^3$
density, $D = 8.0 \text{ g/cm}^3$

Unknown: *mass*, $m = ? \text{ kg}$

Step 2: Rearrange the density equation to calculate for mass.

$$\begin{aligned} \text{density} &= \frac{\text{mass}}{\text{volume}} \\ \text{mass} &= \text{density} \times \text{volume} \\ m &= D \times V \end{aligned}$$

Step 3: Insert the known values into the equation, and solve.

$$\begin{aligned} m &= \left(\frac{8.0 \text{ g}}{\text{cm}^3} \times \frac{10^6 \text{ cm}^3}{\text{m}^3} \right) \times 7.5 \text{ m}^3 = 6.0 \times 10^7 \text{ g} \\ m &= 6.0 \times 10^4 \text{ kg} \end{aligned}$$

PRACTICE

1. 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 cm^3 . If the density of ruby—a form of aluminum oxide—is 3.97 g/cm^3 , what is the mass of the largest ruby?

 2. Certain compounds called *aerogels* form rigid, lightweight foams that can support a mass many times greater than their own. If a sample of an aerogel has a volume of 87.3 cm^3 and a density of 0.250 g/cm^3 , what is its mass?
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