Sample Density Problems

1) What is the volume of a tank that can hold 18 754 g of methanol whose density is 0.788 g/cm^3?

2) What is the density of a board whose dimensions are 6.64 cm x 30.6 cm X 1.99 cm and whose mass is 286 g?

3) In pottery class, you throw a pot from a lump of wet clay. Your pot's mass is 55 g. After the pot is fired, its mass is 49 g. 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?

4) Using the numbers from question 3, what was the volume of the pot after it was fired?

5) The Italian government is giving Michelangelo's David a bath. If the statue is 4900 cm^3 and the density of marble is 2.76 g/cm^3 what is the mass?

6) The volume of the aquarium in our classroom is 18900 mL. The density of seawater is 1.03g/cm^3. What is the mass of the water in our tank?

7) 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 cm^3 and a mass of 3490 g. What is the density of Honduras mahogany?

8) (Continuation of question 7) An identical hope chest made of Spanish mahogany has a mass of 5508 g. What is the density of Spanish mahogany?

9) A graduated cylinder has a mass of 80 g when empty. When 20 mL of water is added, the graduated cylinder has a mass of 100 g. If a stone is added to the graduated cylinder, the water level rises to 40 mL and the total mass is now 136 g. What is the density of the stone?

10) Mercury metal is poured into a graduated cylinder that holds exactly 22.5 mL. The mercury used to fill the cylinder has a mass of 306.0 g. From this information, calculate the density of mercury.

11) A rectangular block of copper metal weighs 1896 g. The dimensions of the block are 8.4 cm by 5.5 cm by 4.6 cm. From this data, what is the density of copper?

12) Tim wanted to find the density of an unknown liquid. To start, he put a graduated cylinder on the balance and found that the cylinder alone had a mass of 40 g. He then put 15 mL of the liquid into the cylinder and placed it back on the balance. Now, the graduated cylinder **plus** the liquid had a mass of 9.9 g. What is the density of the liquid?

13) Look at your result for #12 and the table below. What is the liquid that Tim tested?

Substance	Density (g/mL)
Water	1
Rubbing Alcohol	0.786
Gasoline	**0.66**

14) A flask that has a mass of 345.8 g is filled with 225 mL of carbon tetrachloride. The mass of the flask and carbon tetrachloride is found to be 703.55 g. From this information, calculate the density of carbon tetrachloride.

D = 1.59 g/mL

15) 28.5 g of iron is added to a graduated cylinder containing 45.5 mL of water. The water level rises to the 49.1 mL mark. From this information, calculate the density of iron.

D = 7.92 g/mL

Name _____

Sample Density Problems *Answers*

1) What is the volume of a tank that can hold 18 754 g of methanol whose density is

    0.788 g/cm^3?

V = 23800 cm^3

2) What is the density of a board whose dimensions are 6.64 cm x 30.6 cm X 1.99 cm and

    whose mass is 286 g?

D = 0.707 g/cm^3

3) In pottery class, you throw a pot from a lump of wet clay. Your pot's mass is 55 g.

After the pot is fired, its mass is 49 g. 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?

V = 34.375 cm^3

4) Using the numbers from question 3, what was the volume of the pot after it was fired?

V = 36.0 cm^3

5) The Italian government is giving Michelangelo's David a bath. If the statue is 4900

cm^3 and the density of marble is 2.76 g/cm^3 what is the mass?

M = 13524 g

6) The volume of the aquarium in our classroom is 18900 mL. The density of seawater is

    1.03g/cm^3. What is the mass of the water in our tank?

M = 19467 g

7) 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 cm^3 and a mass of 3490 g. What is the density of Honduras mahogany?

D = 5.39 g/cm^3

8) (Continuation of question 7) An identical hope chest made of Spanish mahogany has a mass of 5508 g. What is the density of Spanish mahogany?

D = 8.5 g/cm^3

9) A graduated cylinder has a mass of 80 g when empty. When 20 mL of water is added, the graduated cylinder has a mass of 100 g. If a stone is added to the graduated cylinder, the water level rises to 40 mL and the total mass is now 136 g. What is the <u>density</u> of the stone?

D = 1.8 g/mL

10) Mercury metal is poured into a graduated cylinder that holds exactly 22.5 mL. The mercury used to fill the cylinder has a mass of 306.0 g. From this information, calculate the density of mercury.

D = 13.6 g/mL

11) A rectangular block of copper metal weighs 1896 g. The dimensions of the block are 8.4 cm by 5.5 cm by 4.6 cm. From this data, what is the density of copper?

D = 8.9 g/cm^3

12) Tim wanted to find the density of an unknown liquid. To start, he put a graduated cylinder on the balance and found that the cylinder alone had a mass of 40 g. He then put 15 mL of the liquid into the cylinder and placed it back on the balance. Now, the graduated cylinder **plus** the liquid had a mass of 9.9 g. What is the density of the liquid?

D = 0.66 g/mL

13) Look at your result for #12 and the table below. What is the liquid that Tim tested?

Substance	Density (g/mL)
Water	1
Rubbing Alcohol	0.786
Gasoline	**0.66**

14) A flask that has a mass of 345.8 g is filled with 225 mL of carbon tetrachloride. The mass of the flask and carbon tetrachloride is found to be 703.55 g. From this information, calculate the density of carbon tetrachloride.

D = 1.59 g/mL

15) 28.5 g of iron is added to a graduated cylinder containing 45.5 mL of water. The water level rises to the 49.1 mL mark. From this information, calculate the density of iron.

D = 7.92 g/mL