

## 1.2.7: Practice with Density

### Exercise 1.2.7.1

What is the density of a material if a sample with a mass of 45.82 g takes up a volume of 8.75 mL?

**Answer**

5.24 g/mL

What mass would a sample of 32.6 cm<sup>3</sup> of copper be? The density of copper is 8.96 g/cm<sup>3</sup>.

**Answer**

292 g

What volume of acetone would have a mass of 142.5 g? The density of acetone is 0.784 g/mL.

**Answer**

182 mL

### Exercise 1.2.7.1

An empty beaker has a mass of 65.873 g. You add 23.8 mL of solution, and the beaker now has a mass of 85.347 g. What is the density of your solution?

**Answer**

0.818 g/mL

You have a rectangular block of metal that measures 4.82 cm long, 3.44 cm wide, and 2.65 cm high. The mass is 197.7 g. What is the density of the metal?

**Answer**

4.50 g/cm<sup>3</sup>

To a graduated cylinder with 22.5 mL of water you add 38.95 g of metal pieces. The water level rises to 28.0 mL. What is the density of the metal?

**Answer**

7.1 g/mL

### Exercise 1.2.7.1

You have a copper metal cylinder that is 5.80 cm high. The diameter of the cylinder is 1.44 cm. What would the mass of this cylinder be? The density of copper is 8.96 g/cm<sup>3</sup>. The formula to calculate the volume of a cylinder is  $V = (\pi)r^2h$ , where  $r$  is the radius (half the diameter) and  $h$  is the height. If your calculator doesn't have a button for pi, use the value  $\pi = 3.14159$ .

**Hint**

The volume of the cylinder is 9.45 cm<sup>3</sup>. (9.44589... cm<sup>3</sup> with 3 significant figures)

**Answer**

84.6 g (If you round the volume to 9.45 cm<sup>3</sup>, you get 84.7 g. If you keep the digits in your calculator and round at the very end, it is 84.6 g.)

You have a graduated cylinder with the water level at 30.8 mL. You add 72.88 g of copper to the water. The density of copper is  $8.96 \text{ g/cm}^3$ . What is the final water level?

**Hint**

The volume of copper added is  $8.13 \text{ cm}^3$ , which equals 8.13 mL.

**Answer**

38.9 mL is the water level after the copper is added.

Before you add acetone to a beaker, the mass is 59.43 g. After you add the acetone, the mass is 81.09 g. The density of acetone is  $0.784 \text{ g/mL}$ . What volume of acetone is in the beaker?

**Hint**

The mass of acetone added is 21.66 g.

**Answer**

27.6 mL

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