PROBLEMS

Volume and Density

27. What is the volume, in cubic meters, of a rectangular solid that is 0.25 m long, 6.1 m wide, and 4.9 m high?

28. Find the density of a material, given that a 5.03 g sample occupies 3.24 mL. (Hint: See Sample Problem 2-1.)

29. What is the mass of a sample of material that has a volume of 55.1 cm^3 and a density of 6.72 g/cm^3?

30. A sample of a substance that has a density of 0.824 g/mL has a mass of 0.451 g. Calculate the volume of the sample.

Conversion Factors

31. How many grams are there in 882 μg? (Hint: See Sample Problem 2-2.)

32. Calculate the number of mL in 0.603 L.

33. The density of gold is 19.3 g/cm^3.
a. What is the volume, in cm^3, of a sample of gold with mass 0.715 kg?
b. If this sample of gold is a cube, how long is each edge in cm?

34. a. Find the number of km in 92.25 m.
b. Convert the answer in km to cm.

Percent Error

35. A student measures the mass of a sample as 9.67 g. Calculate the percent error, given that the correct mass is 9.82 g. (Hint: See Sample Problem 2-3.)

36. A handbook gives the density of calcium as 1.54 g/cm^3. What is the percent error of a density calculation of 1.25 g/cm^3 based on lab measurements?

37. What is the percent error of a length measurement of 0.229 cm if the correct value is 0.225 cm?

Significant Figures

38. How many significant figures are there in each of the following measurements? (Hint: See Sample Problem 2-4.)
a. 0.4004 mL
b. 6000 g
c. 1.000 30 km
d. 400. mm

39. Calculate the sum of 6.078 g and 0.3329 g.

40. Subtract 7.11 cm from 8.2 cm. (Hint: See Sample Problem 2-5.)

41. What is the product of 0.8102 m and 3.44 m?

42. Divide 94.20 g by 3.167 22 mL.

Scientific Notation

43. Write the following numbers in scientific notation.
a. 0.000 673 0
b. 50 000.0
c. 0.000 003 010

44. The following numbers are in scientific notation. Write them in ordinary notation.
a. 7.050×10^{-3} g
b. $4.000\ 05 \times 10^{7}$ mg
c. $2.350\ 0 \times 10^{4}$ mL

45. Perform the following operation. Express the answer in scientific notation and with the correct number of significant figures.

$$\frac{6.124\ 33 \times 10^{6}\ m^3}{7.15 \times 10^{-3}\ m}$$

46. A sample of a certain material has a mass of 2.03×10^{-3} g. Calculate the volume of the sample, given that the density is 9.133×10^{-1} g/cm^3. Use the four-step method in solving the problem. (Hint: See Sample Problem 2-6.)

MIXED REVIEW

47. A man finds that he has a mass of 100.6 kg. He goes on a diet, and several months later he finds that he has a mass of 96.4 kg. Express each number in scientific notation, and calculate the number of kilograms the man has lost by dieting.

48. A large office building is 1.07×10^{2} m long, 31 m wide, and 4.25×10^{2} m high. What is its volume?

49. An object is found to have a mass of 57.6 g. Find the object's density, given that its volume is 40.25 cm^3.