c. 31 947.972 cm^2 to four significant figures
d. 192.6739 m^2 to five significant figures
e. 786.9164 cm to two significant figures
f. 389 277 600 J to six significant figures
g. 225 834.762 cm^3 to seven significant figures

40. Perform the following calculations, and express the answer in the correct units and number of significant figures.
a. 651 cm × 75 cm
b. 7.835 kg ÷ 2.5 L
c. 14.75 L ÷ 1.20 s
d. 360 cm × 51 cm × 9.07 cm
e. 5.18 m × 0.77 m × 10.22 m
f. 34.95 g ÷ 11.169 cm^3

41. Perform the following calculations, and express the answer in the correct units and number of significant figures.
a. 7.945 J + 82.3 J − 0.02 J
b. 0.0012 m − 0.000 45 m − 0.000 11 m
c. 500 g + 432 g + 2 g
d. 31.2 kPa + 0.0035 kPa − 0.147 kPa
e. 312 dL − 31.2 dL − 3.12 dL
f. 1701 kg + 50 kg + 43 kg

42. A rectangle measures 87.59 cm by 35.1 mm. Express its area with the proper number of significant figures in the specified unit.
a. in cm^2 **c.** in m^2
b. in mm^2

43. A box measures 900. mm by 31.5 mm by 6.3 cm. State its volume with the proper number of significant figures in the specified unit.
a. in cm^3 **c.** in mm^3
b. in m^3

44. A 125 mL sample of liquid has a mass of 0.16 kg. What is the density of the liquid in the following measurements?
a. kg/m^3 **c.** kg/dm^3
b. g/mL

45. Perform the following calculations, and express the results in the correct units and with the proper number of significant figures.
a. 13.75 mm × 10.1 mm × 0.91 mm
b. 89.4 cm^2 × 4.8 cm
c. 14.9 m^3 ÷ 3.0 m^2
d. 6.975 m × 30 m × 21.5 m

46. What is the volume of a region of space that measures 752 m × 319 m × 110 m? Give your answer in the correct unit and with the proper number of significant figures.

47. Perform the following calculations, and express the results in the correct units and with the proper number of significant figures.
a. 7.382 g + 1.21 g + 4.7923 g
b. 51.3 mg + 83 mg − 34.2 mg
c. 0.007 L − 0.0037 L + 0.012 L
d. 253.05 cm^2 + 33.9 cm^2 + 28 cm^2
e. 14.77 kg + 0.086 kg − 0.391 kg
f. 319 mL + 13.75 mL + 20. mL

48. A container measures 30.5 mm × 202 mm × 153 mm. When it is full of a liquid, it has a mass of 1.33 kg. When it is empty, it has a mass of 0.30 kg. What is the density of the liquid in kilograms per liter?

49. If 7.76 km of wire has a mass of 3.3 kg, what is the mass of the wire in g/m? What length in meters would have a mass of 1.0 g?

50. A container of plant food recommends an application rate of 52 kg/ha. If the container holds 10 kg of plant food, how many square meters will it cover? (1 ha = 10 000 m^2)

51. A chemical process produces 974 550 kJ of energy as heat in 37.0 min. What is the rate in kilojoules per minute? What is the rate in kilojoules per second?

52. A water pipe fills a container that measures 189 cm × 307 cm × 272 cm in 97 s.
a. What is the volume of the container in cubic meters?
b. What is the rate of flow in the pipe in liters per minute?
c. What is the rate of flow in cubic meters per hour?

53. Perform the following calculations, and express the results in the correct units and with the proper number of significant figures. Note, in problems with multiple steps, it is better to perform the entire calculation and then round to significant figures.
a. (0.054 kg + 1.33 kg) × 5.4 m^2
b. 67.35 cm^2 ÷ (1.401 cm − 0.399 cm)
c. 4.198 kg × (1019 m^2 − 40 m^2) ÷ (54.2 s × 31.3 s)
d. 3.14159 m × (4.17 m + 2.150 m)
e. 690 000 m ÷ (5.022 h − 4.31 h)
f. (6.23 cm + 3.111 cm − 0.05 cm) × 14.99 cm

Scientific Notation: Chap. 2, Sec. 3

Converting Quantities to Scientific Notation

54. Express the following quantities in scientific notation.
a. 8 800 000 000 m
b. 0.0015 kg
c. 0.000 000 000 06 kg/m^3
d. 8 002 000 Hz
e. 0.009 003 A
f. 70 000 000 000 000 000 km
g. 6028 L
h. 0.2105 g
i. 600 005 000 kJ/h
j. 33.8 m^2

Calculating with Quantities in Scientific Notation

55. Carry out the following calculations. Express the results in scientific notation and with the correct number of significant figures.
a. 4.74×10^4 km + 7.71×10^3 km + 1.05×10^3 km
b. 2.75×10^{-4} m + 8.03×10^{-5} m + 2.122×10^{-3} m
c. 4.0×10^{-5} m^3 + 6.85×10^{-6} m^3 − 1.05×10^{-5} m^3
d. 3.15×10^2 mg + 3.15×10^3 mg + 3.15×10^4 mg
e. 3.01×10^{22} atoms + 1.19×10^{23} atoms + 9.80×10^{21} atoms
f. 6.85×10^7 nm + 4.0229×10^8 nm − 8.38×10^6 nm