Chemistry **Worksheet #1**

1 mile = 5,280 ft 1 inch = 2.54 cm 3 feet = 1 yard 454 g = 1lb 946 mL = 1 qt

I. Set up and solve the following using dimensional analysis.

1. 5,400 in to mi
2. 16 weeks to sec
3. 54 yards to mm
4. 36 cm/sec to mph
5. 1.09 g/mL to lbs/gal
6. 19 in^2 to ft^2
7. 840 in^3 to cm^3
8. 4.22 g/cm^3 to $lbs./ft^3$
9. 2.50 d/hr to kronin/wk (1 d = 8.60 krc)
10. 32 ft/sec^2 to $meters/min^2$

II. Rewrite the following numbers using scientific notation.

1. 476
2. 840,000
3. 0.0822
4. 540×10^3
5. 0.000040087
6. 0.0067×10^{-3}
7. 16
8. 0.446
9. 28×10^{-4}
10. 0.0062×10^5

III. How many significant figures are in each of the following numbers or answers to the following mathematical operations.

1. 16.0
2. 54,000
3. 54,000.0
4. 0.000107
5. 6,007
6. 14/ 3.07
7. 5.400×10^3/ 176
8. 1,874 x 36.2
9. 14/ 367
10. 176/ 1.4809×10^6

IV. Perform the following mathematical operations and express your answers to the proper number of significant figures.

1. $642 \times (4.0 \times 10^{-5})$
2. 17/ 3.88×10^7
3. $(2.9 \times 10^{-5}) \times (8.1 \times 10^2)$
4. $(4.3 \times 10^{-5})^3$
5. 5.40×10^{-18}/ 769
6. $59 \times (3.24 \times 10^{-2})$/ 4.80×10^4
7. $42 \times (6.02 \times 10^{23})$/ .016
8. 12.0/ 6.02×10^{23}
9. 0.00000016/ 74.3
10. 10.0/ 54,600

V. Answer the following questions keeping in mind significant figures and dimensional analysis.

1.What is the density of an object that has a mass of 67.0 g and a volume of 14.7 mL?
2. What is the density of an object that has a mass of 17.0 g and is a cube with dimensions of 1.2 cm x 7.4 cm x 3.0 cm?
3. What volume will 88.0 g of an object with a density of 3.44 g/ mL occupy?
4. How many quarts will 15.0 lbs of a liquid with a density of 2.08 g/ mL occupy?
5. What will be the mass of 0.047 liters of a substance with a density of 8.73 g/ mL?

Solutions

I.

1) 0.085 mi
2) 9,700,000 sec
3) 49,000 mm
4) 0.81 mi/hr
5) 9.08 lbs/gal
6) 0.13 ft^2
7) 1.4×10^4 cm^3
8) 263 lbs/ ft^3
9) 3.61×10^3 kronin/wk
10) 35,000 m/ min^2

II.

1) 4.76×10^2
2) 8.4×10^5
3) 8.22×10^{-2}
4) 5.4×10^5
5) 4.0087×10^{-5}
6) 6.7×10^{-6}
7) 1.6×10^1
8) 4.46×10^{-1}
9) 2.8×10^{-3}
10) 6.2×10^2

III.

1) 3
2) 2
3) 6
4) 3
5) 4
6) 2
7) 3
8) 3
9) 2
10) 3

IV.

1) 2.6×10^{-2}
2) 4.4×10^{-7}
3) 2.3×10^{-2}
4) 8.0×10^{-14}
5) 7.02×10^{-21}
6) 4.0×10^{-5}
7) 1.6×10^{27}
8) 1.99×10^{-23}
9) 2.2×10^{-9}
10) 1.83×10^{-4}

V.

1) 4.56 g/mL
2) 0.64 g/ cm^3
3) 25.6 mL
4) 3.47 qts.
5) 410 g