

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

II. Rewrite the following numbers using scientific notation.

- | | |
|--------------------------|------------------------------|
| 1. 476 | 6. 0.0067 x 10 ⁻³ |
| 2. 840,000 | 7. 16 |
| 3. 0.0822 | 8. 0.446 |
| 4. 540 x 10 ³ | 9. 28 x 10 ⁻⁴ |
| 5. 0.000040087 | 10. 0.0062 x 10 ⁵ |

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

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

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

- | | |
|---------------------------------------------------------|------------------------------------------------------------|
| 1. 642 x (4.0 x 10 ⁻⁵) | 6. 59 x (3.24 x 10 ⁻²)/ 4.80 x 10 ⁴ |
| 2. 17/ 3.88 x 10 ⁷ | 7. 42 x (6.02 x 10 ²³)/ .016 |
| 3. (2.9 x 10 ⁻⁵) x (8.1 x 10 ²) | 8. 12.0/ 6.02 x 10 ²³ |
| 4. (4.3 x 10 ⁻⁵) ³ | 9. 0.00000016/ 74.3 |
| 5. 5.40 x 10 ⁻¹⁸ / 769 | 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 ft²
- 7) 1.4×10^4 cm³
- 8) 263 lbs/ ft³
- 9) 3.61×10^3 kronin/wk
- 10) 35,000 m/ min²

III.

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

V.

- 1) 4.56 g/mL
- 2) 0.64 g/ cm³
- 3) 25.6 mL
- 4) 3.47 qts.
- 5) 410 g

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

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}