

Chemistry

Worksheet #1

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

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

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|-------------------------|--|
| 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.

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

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

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

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

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