

# Chapter 9 Worksheet #9.1

## Dimensional Analysis & Significant Figures

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.

- 5,400 in to mi
- 16 weeks to sec
- 54 yards to mm
- 36 cm/sec to mph
- 1.09 g/mL to lbs/gal
- 19 in<sup>2</sup> to ft<sup>2</sup>
- 840 in<sup>3</sup> to cm<sup>3</sup>
- 4.22 g/cm<sup>3</sup> to lbs./ft<sup>3</sup>
- 2.5 years in seconds
- 32 ft/sec<sup>2</sup> to meters/min<sup>2</sup>

II. Rewrite the following numbers using scientific notation.

- 476
- 840,000
- 0.0822
- $540 \times 10^3$
- 0.000040087
- $0.0067 \times 10^{-3}$
- 16
- 0.446
- $28 \times 10^{-4}$
- $0.0062 \times 10^5$

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

- 16.0
- 54,000
- 54,000.0
- 0.000107
- 6,007
- 14/ 3.07
- $5.400 \times 103/ 176$
- $1,874 \times 36.2$
- 14/ 367
- $176/ 1.4809 \times 10^6$

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

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

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

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