

## Math Review & Problem-Solving 3

### DIRECTIONS

Work in small groups to solve the following problems. Ask questions of one another first, and if you cannot determine the answer as a group, consult with the instructor. Your group may be asked to present a problem to the full class. Show all units and express answers to the correct number of significant digits.

### SIGNIFICANT DIGITS

1. $80 \text{ cm} + 13.0 \text{ cm} =$	5. $0.7600 \text{ mm}^3 / 0.0152 \text{ mm} =$
2. $3.4 \times 10^{-9} \text{ m} + 1.27 \times 10^{-7} \text{ m} =$	6. $3 \text{ cm} \times 6 \text{ cm} =$
3. $750. \text{ g} + 677.4 \text{ g} =$	7. $(8.6 \text{ g} + 7.8 \text{ g}) / 23.51 \text{ cm}^3 =$
4. $1100 \text{ cm} + 8 \text{ cm} =$	8. $6.000 \times 10^{-3} \text{ m} \times 0.0020 \text{ m} =$

### SCIENTIFIC NOTATION

Express the following numbers in scientific notation with the proper number of significant digits:	Express the following numbers in long form with the proper number of significant digits:
9. 0.000 002 158	16. $3.56 \times 10^{-3}$
10. 6,024,000	17. $6.85 \times 10^5$
11. 500.0	18. $9.500 \times 10^2$
12. 0.00120	19. $3.000 \times 10^3$
13. $125.2 \times 10^{-2}$	20. $1.20 \times 10^{-2}$
14. $0.0000552 \times 10^3$	21. $5.00 \times 10^5$
15. $35.882 \times 10^{-6}$	

### DIMENSIONAL ANALYSIS

22. Convert 32.5 oz to cg	25. Convert $9.86 \times 10^8 \text{ dm}^2$ to $\text{km}^2$
23. Convert 3.55 mL to gallons	26. Convert 65 mi/hr to m/s
24. Convert 8.6 $\mu\text{g}$ to dg	27. Convert 13.6 g/mL to $\text{lb}/\text{ft}^3$

### MOLES & DENSITY

28. Calculate the number of moles equal to  $1.23 \times 10^{24}$  molecules of  $\text{PCl}_5$ .
29. Calculate the number of formula units equivalent to 5.93 g of  $\text{SiO}_2$ .
30. Ethylene glycol, used in antifreeze, has a density of 1.11 g/mL. What is the mass in kg of 1.00 gallons of the compound?
31. If 5.25 g of silver is added to a graduated cylinder containing 11.2 mL of water, to what level will the water level rise? (You can find the density of silver on the Sargent-Welch Periodic Table.)
32. Wood floats on water because it is less dense than water. If a cubic piece of metal has sides of 1.25 cm and a mass of 37.7 g, will the metal float on a pool of mercury?