

Measurements and Calculations

1. What is the difference between accuracy and precision?
2. You take the mass of a sample of carbon (4 different times) and find the masses to be 1.01g, 1.00g, 0.99g, and 0.98g. The know mass of the sample is 1.00g.
 - a. Were the measurements accurate or precise?
 - b. Explain your answer.
3. Determine the number of significant figures in the following:
 - a. 4001.006 g
 - b. 3 cars
 - c. 0.0000456 m
 - d. 1001.000000 s
 - e. 100 g/s
 - f. 10.00000456 L
 - g. 2000000 g
 - h. 2000000.0 ml
 - i. 2000000000.00 km
 - j. 20 students
4. Explain why some numerical values have infinite significant digits.
5. Convert the following to scientific notation:
 - a. 0.0000036 g
 - b. 1450000 mg
 - c. 2340 m
 - d. 111.34 g/ml
6. Solve the following problems with the correct number of significant digits and unit:
 - a. $300. \text{ kPa} \times 274.57 \text{ mL} / 547 \text{ kPa}$
 - b. $346 \text{ mL} \times 200 \text{ K} / 546.4 \text{ K}$
 - c. $(3.9 \times 10^3)(6.7 \times 10^2)$
 - d. $3.01 \times 10^{23} / 2.56 \times 10^6$
 - e. $(6.02 \times 10^{23})(2.00)$
 - f. $6.02 \times 10^{23} / 3.00$
7. Three students measure the length of a piece of copper. The lengths were 5.05 cm, 5 cm, and 5.1 cm, so what is the average length of the copper as taken by the students?