

IV. Measurements Problems

Quality of Measurements: Accuracy & Precision

0. a) Can a measurement be exact?
 - b) What two things do most measurements contain?
 - c) In addition to specifying a numerical value for a measurement, scientists often need to know how much confidence to place in a measurement. State one way to provide information about how much confidence one could have in the quality of a measurement.
 - d) True or false: There is only one rule for rounding/s.f. after a calculation. Explain your answer.
1. Define accuracy (use words, not a mathematical formula).
2. Identify a parameter that tells you how accurate a measurement is and write the equation for this parameter.
3. Can you make an assessment of accuracy for a single measurement?
4. Define precision (use words, not a mathematical formula).
5. Identify two different statistical parameters that provide information about the precision of a data set.
6. Can you make an assessment of precision for a single measurement?

Unit Conversions

0. Write the symbols for the six metric units you need to memorize for this class.
1. Write the numerical relationships for the six metric units you need to memorize for this class.

By analogy to English units: 12 inches = 1 foot
2. Re-write the relationships from question #1 above in inverted fashion. Ex: 1 inch = 1/12 foot.
3. Perform the following conversions:
 $455 \text{ mL} = ? \text{ pt}$ $455 \text{ mL} = ? \text{ L}$ $455 \text{ mL} = ? \text{ nL}$
4. If my plasma LDL level is 128 mg/dL, how many g/L is that?
5. Convert your height from inches into meters, your weight from pounds into kilograms, and the volume of your favorite canned/bottled beverage from ounces (or pints) into mL.