1.   True or false:
  A. As the $[H^+]$ in a solution increases the pH value increases.
  B. A solution of CO_2 in water is acidic
  C. In the same size containers 5.00g of O_2 gas has the same pressure as 5.00g of N_2 gas.
  D. All isotopes are radioactive.
  E. Beta rays consist of electrons.
  F. Increasing amounts of CO_2 in earth's atmosphere is suggested as a key reason for global warming.
  G. The pressure of a gas increases as the volume of its container decreases.
  H. When more water is added to a solution of an acid in water the pH does not change.
  I. Agricultural chemicals are one source of water pollution.
  J. When an isotope emits gamma rays it becomes a different element.

2. Explaining your answer, which is more acidic, a solution with $[H^+]$ of 4.5×10^{-6} molar or a solution of pH = 5.0?

3. A solution of an acid in water has 0.0400 mol of H^+ ion in 1.50 L of solution.
   A. What is the molarity of H^+ ions in the solution?

   B. What is the molarity of OH^- ions in the solution?

4. A solution contains 4.5×10^{-5} grams of Pb^{2+} in 3.00L of solution. What is the concentration of Pb^{2+} in parts per million (ppm)?

5. What is the pressure in atmospheres of 1.00 gram of O_2 gas in a 500.0 mL container at $20.0^\circ C$?

6.   A. An atom of an element with an atomic number of 95 and a mass number of 241 emits an alpha particle.
          what are the atomic number and the mass number of the product?
       B. An atom of nickel with a mass number of 63 emits a beta particle. What are the atomic number and mass number of the product?

7. How do nuclear fission and nuclear fusion differ?

8. If a person breathes in $21.0 m^3$ of air per day and the air contains 263 micrograms of particulates per m^3 how many grams of particulates does a person breathe in per day

9. If you originally have 156 grams of a radioactive isotope, how many grams of it remain after 4 half life periods?

10. Using appropriate equations show why acid rain can result when fuels containing sulfur are burned.