Name: _____ Date: _____

Unit 1.7
Periodic Trends

1. Which atom in each set has the larger radius?
   (a) Be or O
   (b) Cu or Br
   (c) F or I
   (d) O or As
   (e) Kr or K
   (f) Ba or Li

2. Explain each of the following occurrences by referring to the structure of the atoms in question (energy levels, orbitals, protons, etc.).
   (a) The atomic radius of oxygen is smaller than the atomic radius of carbon.

   (b) The atomic radius of Mg is smaller than the atomic radius of Ca.

3. Mg^{2+} and F^- are isoelectronic.
   (a) Which ion has the smaller radius?

   (b) Explain why the radii of these two ions are different sizes. Justify your claims.

4. Explain each of the following occurrences by referencing the structure of the atoms in question (energy levels, orbitals, protons, etc.).
   a) The first ionization energy of Mg is 738.1 kJ/mol, while the first ionization energy of Al is only 577.9 kJ/mol.

   b) The first ionization energy of Na is less than the first ionization energy of Cl.

5. Why do the halogens have a negative electron affinity value, while the noble gases have a positive electron affinity value?

6. Which element from each set is most electronegative?

    1. F or C
    2. Al or Cl
    3. Ga or O
    4. Zn or K

7. Sulfur is more electronegative than calcium. Explain why this is and justify your claims using your knowledge of atomic structure.