3. **a.** $1s^2 2s^2 2p^6 3s^2 3p^6 3d^5 4s^2$

   b. manganese

4. **a.** 9, $1s^2 2s^2 2p^6 3s^2 3p^6$

   b. argon

Practice Problems C

1. **a.** $1s^2 2s^2 2p^6 3s^2 3p^6 3d^{10} 4s^2 4p^6 4d^{10} 5s^2 5p^6 6s^2$, [Xe]$6s^2$

   b. Be, Mg, Ca, Sr

2. **a.** [Xe]$4f^{14} 5d^{10} 6s^1$

   b. Au, Cs, Pt

Math Tutor Practice

1. 85.47 amu
2. 28.1 amu

The Periodic Law

Practice Problems A

1. Group 1, fifth period, *s* block
2. **a.** ns^2

   b. $1s^2 2s^2 2p^6 3s^2 3p^6 4s^2$

   c. Ca, [Ar]$4s^2$

Practice Problems B

1. fourth period, *d* block, Group 10
2. $4d^{10} 5s^2$

Practice Problems C

1. **a.** $3s^2 3p^5$

   b. chlorine, nonmetal

2. **a.** fourth period, *p* block, Group 15

   b. arsenic, metalloid

Practice Problems D

1. **a.** *p* block, second period, Group 17, halogens, fluorine, nonmetal, high reactivity

   b. *d* block, fourth period, Group 11, transition elements, copper, metal, low reactivity

Practice Problems E

1. Li; F
2. All of the elements are in Group 2. Of the four, barium has the highest atomic number and is farthest down the group. Therefore, barium has the largest atomic radius because atomic radii increase down a group.
3. All of the elements are in Period 3. Of the four, silicon has the largest atomic number and therefore is the farthest to the right on the periodic table. Therefore, silicon has the smallest atomic radius because atomic radii decrease from *left to right* across a period.

Practice Problems F

1. **a.** Q is in the *p* block, R is in the *s* block, T is in the *p* block, and X is in the *p* block.

   b. Q and R, and X and T are in the same period. Q and T are in the same group.

   c. Q would have the highest ionization energy, and R would have the lowest.

   d. R

   e. R

Practice Problems G

1. **a.** All are in the *p* block. E, J, and M are in the same period, and E, G, and L are in the same group.

   b. E should have the highest electron affinity; E, G, and L are most likely to form 1– ions; E should have the highest electronegativity.

   c. The ionic radius would be larger.

   d. E, G, and L

Math Tutor Practice

1. **a.** $1s^2 2s^2 2p^6 3s^2 3p^1$

   b. $1s^2 2s^2 2p^6$

   c. $1s^2 2s^2 2p^6 3s^2 3p^6 3d^{10} 4s^2 4p^6 4d^{10} 5s^2 5p^2$

   d. $1s^2 2s^2 2p^6 3s^2 3p^6 4s^1$

2. **a.** [Ne]$3s^2 3p^2$

   b. [Kr]$5s^1$

   c. [Kr]$4d^{10} 5s^2 5p^3$

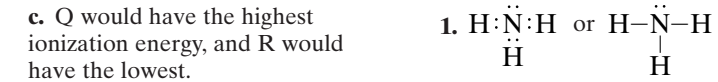
   d. [Ar]$3d^{10} 4s^2 4p^3$

Chemical Bonding

Practice Problems A

See table below.

Practice Problems C

1. 

2. 

Bonding between chlorine and	Electronegativity difference	Bond type	More-negative atom
calcium	3.0 – 1.0 = 2.0	ionic	chlorine
oxygen	3.5 – 3.0 = 0.5	polar-covalent	oxygen
bromine	3.0 – 2.8 = 0.2	nonpolar-covalent	chlorine