Worksheet 1 — Key — 30 August 2013

1. How many bonds must carbon always have?

   four

2. What type of bonding occurs in alkanes?

   covalent; the sharing of electrons

3. Are alkanes saturated or unsaturated?

   saturated; maximum number of hydrogens

4. What is the difference between conformation isomers and structural isomers?

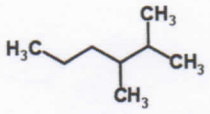
   - conformation - molecules w/ same atom connections but different structures
   - structural - molecules w/ same molecular formula but different atom arrangements

   Ex. C_5H_{12}

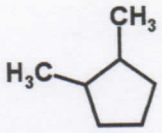
   original:  conf:  stru. 

5. Molecular formula for: alkane C_nH_{2n+2} cycloalkane C_nH_{2n}

6. Give the molecular formula for the following molecules:



a. C_8H_{18}



b. C_7H_{14}

7. Which of the following molecules has the molecular formula C_5H_{10}?

   a. 2-methylpentane
   b. cyclopentane
   c. 1-methylcyclobutane
   d. Pentane

   b.  c. 

   *change "c" to 1-methyl cyclobutane!

8. Draw both the line formula and condensed structural formula for a linear alkane with 7 carbons.

$CH_3CH_2CH_2CH_2CH_2CH_2CH_3$

9. Draw isomers for alkanes with the formula C_6H_{14}.

$CH_3CH_2CH_2CH_2CH_2CH_3$

$CH_3CH(CH_3)CH_2CH_2CH_3$

$CH_3CH_2CH(CH_3)CH_2CH_3$

$CH_3C(CH_3)_2CH_2CH_3$

$CH_3CH(CH_3)CH(CH_3)CH_3$