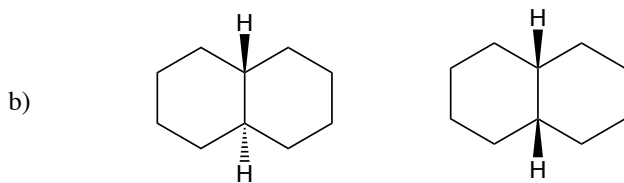
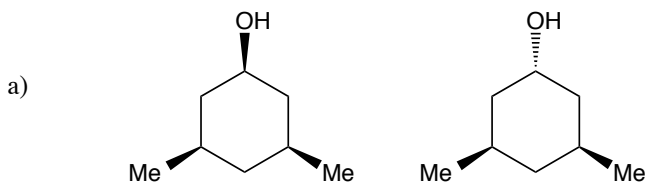


**Problem Set #5**

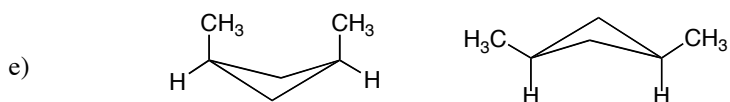
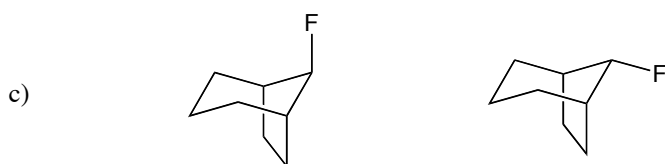
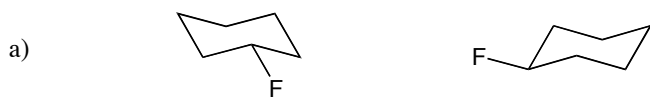
Question 1. Draw methylcyclopropane, methylcyclobutane, methylcyclopentane, and methylcyclohexane in three dimensions in their most stable conformer (if applicable). Identify whether any of the substituents for each ring system are in eclipsing conformations.

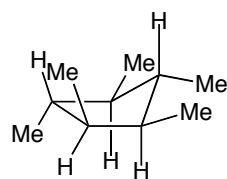
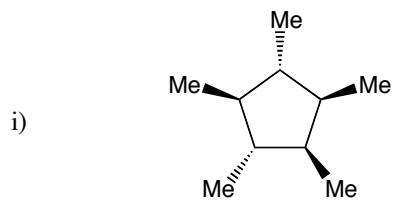
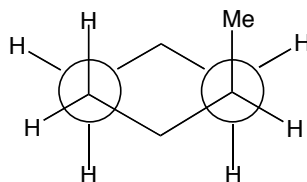
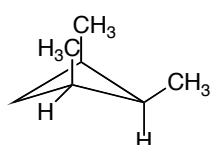
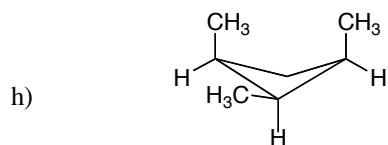
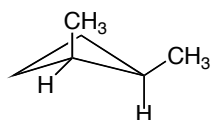
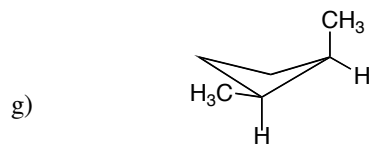
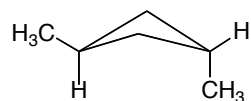
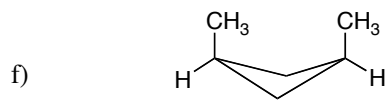
Question 2. Draw each of the following compounds in three dimensions in their lowest energy conformations. Then, circle the **more stable** compound from each pair and give a brief explanation for your answer.



Question 3. For each of the following pairs of molecules, determine how they are related (i.e. enantiomers, diastereomers, structural isomers, conformational isomers, or identical).

*Note: compounds can only be designated conformational isomers if they can be interconverted via single bond rotations and are otherwise identical.*





Question 4. Determine whether the following molecules are chiral (at room temperature). For each chiral compound, draw the enantiomer. For each achiral compound, explain why it is achiral (internal mirror plane, no stereocenters, etc.).

