1. Provide IUPAC names for the following structures:

- 2-propyl-1-t-butylcyclobutane
- 3-chloro-4-ethyl-1-fluoro-6-methylheptane
- 2-bromo-4-chloro-3,4-dimethylhexane
- 1-butyl-3-isobutyl-cycloheptane
- 2,3,3-trimethylpentane
- cis-1,3-dimethylcyclohexane
- trans-1-chloro-4-hydroxy-cyclohexane
- 1-chloro-3-sec-butyl-cyclooctane
- 2,2-dichlorohexane
- 2-bromo-5-ethyl-4-methylheptane
- 1-bromo-5-methyl-3-propylcyclohexane
- 4-ethyl-5-methyloctane
2. Provide the correct structures for the following names:

- 1-bromo-2,2-dimethylpropane
- 1,1,1-trichloro-3-ethyl-5-methyloctane
- 4-(1-methylethyl)nonane
- 3-hydroxy-2-methyl-5-nitrohexane
- 1-sec-butyl-4-isopropylcycloheptane
- cis-1,3-dimethylcyclobutane
- trans-1-amino-2-iodocyclohexane
- 5-butyl-3-isobutyl-1-pentyl-4-propylcyclohexane
3. Draw the most stable Newman projection of 1,2-dibromoethane.

[Diagram of 1,2-dibromoethane]

`most stable conformer of the compound is staggered with the two largest atoms, bromine, as far apart as possible.`

Remember for Newman projections:

1. **Second carbon you see when looking down C-C bond**
2. **First carbon you see when looking down C-C bond**

4. Draw the most stable Newman projection of pentane looking down the C2-C3 bond.

[Diagram of pentane]

`Most stable conformer is staggered, with the two alkyl substituents (methyl on C1 and Ethyl on C2) as far apart as possible.`
5. Draw the two chair conformers of 1-bromocyclohexane and indicate which one is more stable:

![Two chair conformers of 1-bromocyclohexane]

More stable; substituent is equatorial

6. Convert the following stick structure to the appropriate chair conformer(s).

![Methyls are trans!]

OR
7. Draw the bond rotation energy diagram for 2-methylbutane (looking down the C2-C3 bond) with the Newman projections for each point.