1. Name the following compounds:

a. 

\[
\begin{align*}
\text{CH}_2\text{CH}_3 \\
\text{CH}_3\text{CH}_2\text{CCH}_2\text{CH}_2\text{CHCH}_3 \\
\text{CH}_3 & \quad \text{CH}_3
\end{align*}
\]

b. 

\[
\begin{align*}
\text{CH}_2\text{CH}_3 & \quad \text{CH}_3 \\
\text{CH}_3\text{CH}_2\text{CCH}_2\text{CH}_2\text{CHCHCH}_2\text{CH}_2\text{CH}_3 \\
\text{CH}_2\text{CH}_3 & \quad \text{CH}_2\text{CH}_3
\end{align*}
\]

c. 

\[
\begin{align*}
\text{Br}
\end{align*}
\]

d. 

\[
\begin{align*}
\text{O}
\end{align*}
\]

e. 

\[
\begin{align*}
\text{O}
\end{align*}
\]

f. 

\[
\begin{align*}
\text{CH}_3\text{CHCH}_2\text{CHCH}_2\text{CH}_3 \\
\text{CH}_3 & \quad \text{OH}
\end{align*}
\]

g. 

\[
\begin{align*}
\text{Br}
\end{align*}
\]
2. Rank the following sets of compounds in order of increasing boiling point:
   a. bromomethane  bromoethane  1-bromopropane  1-bromobutane
   b. bromoethane  chloroethane  iodoethane  fluoroethane
   c. 1-propanol  1-propanamine  N,N-dimethylmethanamine  N-methylethanamine
   d. 1-pentanol  3-methyl-1-butanol  2,2-dimethyl-1-propanol  1-hexanol

3. Rank the following in order of increasing solubility in water:
4. Draw the Newman projections for the following:
   a. pentane looking down the C₂–C₃ bond with C₂ in front
   b. 3-(1,1-dimethylethyl)heptane looking down the C₃–C₄ bond of the following with C₃ in front

5. Convert the following Newman projection into a perspective line structure.

6. Rank the following conformations of cyclohexane in order of increasing energy
   a. chair
   b. half chair
   c. twist boat
   d. boat

7. Describe the following:
   a. flagpole hydrogens
   b. 1,3-diaxial interactions

8. Determine if each of the following structures are cis or trans:
9. For each molecule, indicate whether the *cis* or *trans* isomer would be the most stable:

10. Draw the most stable chair conformer for the following molecule: