1. Draw all possible stereoisomers of 3-bromo-2-butanol using dash-wedge 3-D structures and assign (R, S) configuration at each stereocenter. Identify the enantiomeric pairs and diastereomeric pairs.

\[
\begin{align*}
\text{H}_3\text{C} & \quad \text{CH}_3 \\
\text{Br} & \quad \text{OH}
\end{align*}
\]

3-bromo-2-butanol

**Previous midterm questions:**

2. *Atropine* is a drug that is extracted from deadly nightshade (*Atropa belladonna*) that is used in the treatment of bradycardia (low heart rate) and cardiac arrest. Most of the physiological effects are due to the L-enantiomer shown below.

\[
\begin{align*}
\text{H}_3\text{C} & \quad \text{O} \\
\text{N} & \quad \text{OH} \\
\text{O} & \quad \text{H} \\
\text{H} & \quad \text{a} \\
\text{O} & \quad \text{H}
\end{align*}
\]

(-)-Atropine

\[
[\alpha]_{25}^D = -22^\circ
\]

*SHOW your work!*

a. Calculate the %ee of a solution with a specific rotation of \(-18.5^\circ\). 

b. What is the sterochemical composition of the sample in part b?

\[
\begin{array}{c}
\%(-): \square \\
\%(+): \square
\end{array}
\]

c. What is \([\alpha]_{25}^D\) for (+)-Atropine?

d. (4 points) What is the observed rotation for a solution of 0.50 g (+)-Atropine and 0.05 g (-)-Atropine in 100 mL of methanol, using a 1 dm cell?

3. Suppose that a solution of a pure chiral compound has a specific rotation of \(-32^\circ\). What is the specific rotation of a solution that is 90\% of the (+)-enantiomer and 10\% of the (-)-enantiomer?

4. Write the correct IUPAC name for the following compound:
5. The following compound is one of the cis-trans isomers of 2,4-dimethyl-1-iodocyclohexane.

\[ \text{Compound A} \]

- Complete the two possible chair conformations shown above.
- Circle the most stable chair conformation (axial energy I: 2.2; axial energy CH\(_3\): 18.)
- Draw a diastereomer of A in the box provided.