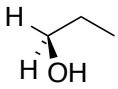
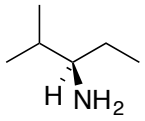
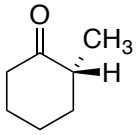
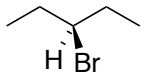
Stereochemistry Quiz, Organic Chemistry I – Jasperse 10 points Name:

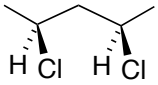
1. For each structure: (5 points total)
   a) star any chiral carbons,
   b) label each chiral carbon as (R) or (S) and
   c) indicate any molecules that are chiral. (Either circle them, or write "chiral" beside).
   - Two tools for assigning molecular chirality: chiral carbons and planes of symmetry.

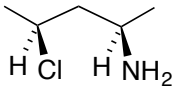


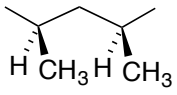


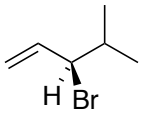








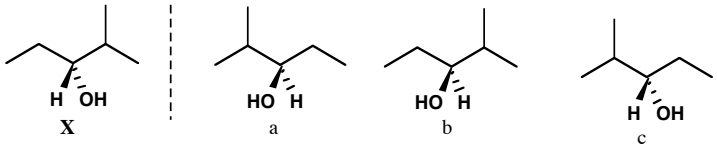




2. Draw the structure for: (1 point, need both perfect)
   a. (R)-3-methylhexane

   b. (S)-2-chlorobutane

3. Relative to **X**, label each of a, b, and c as an enantiomer to X or as the same as X. (1 pt)



4. Draw all possible stereoisomers of 1,3-dichlorocyclopentane, and label each structure as **A**, **B** etc. (2 pts)
   a) Label all chiral C's,
   b) write "chiral" by chiral isomers,
   c) write "meso" if appropriate, and
   d) Classify the relationship between any two structures, for example **A/B enantiomers**, or **A/B diastereomers**, etc.. (For any that are the same, scratch out the duplicate!)

5. Achiral CH_2=$CHCH_2CH_3$ reacts with HCl to produce 2-chlorobutane. (1 point, need all perfect)
   a. Is the product chiral? Yes or no
   b. Will a solution of the product be optically active or racemic?
   c. Will the (S) isomer only, the (R) isomer only, or both isomers form?
   - Note: You should not need to look up the reaction to address the stereochemistry ideas!