Names of all students (please print) _____

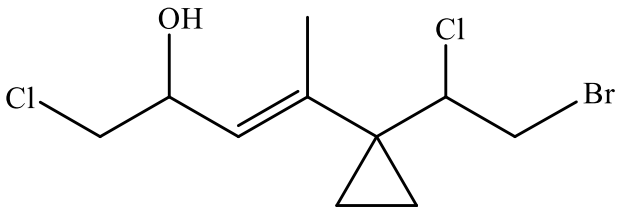
_____

CHEM 243 Organic Chemistry I **Points _____ (10 max)**

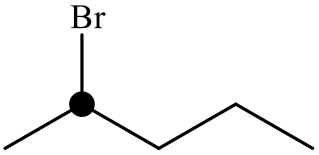
Worksheet #10: October 1, 2021. Complete the following worksheet by collaborating with a group of 3-4 students. You can use a text book or your lecture video notes. You must work together, with the names of all students included on **ONE** sheet and turned in for a group grade.

Please take a few minutes of class time to complete the class survey using the URL link in Blackboard (also emailed to you). Let me know if you need to borrow a laptop in class (https://forms.gle/1UxkySCWz78qLpDB8).

(1) Chiral Carbons. Place a dot (●) on each chiral carbon in the molecule drawn at the right. **REMEMBER:** Chiral carbons must be sp3 hybridized, and bonded to 4 different atoms or groups. **HINT:** Start by focusing on carbons where you "see" either 3 or 4 bonds in the zig-zag structure.

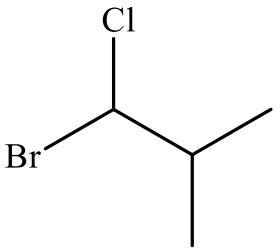


(2) Stereoisomers – Introduction to Enantiomers. In **2-bromopentane**, are the following statements about this compound **TRUE** or **FALSE**?



_____ C-2 is sp2 hybridized and trigonal planar
_____ 2-bromopentane has 2x1° carbons, and 3x2° carbons
_____ C-2 is bonded to 4 different atoms or groups of atoms
_____ C-2 is sp3 hybridized and a chiral carbon
_____ 2-bromopentane has two, non-superimposable mirror images
_____ the two mirror image molecules of 2-bromopentane are a type of stereoisomer called enantiomers
_____ enantiomers have the same formula and connectivity, but differ in their 3D configurations
_____ the two enantiomers will have different melting points and boiling points
_____ a mixture of the two enantiomers is called a racemic mixture

(3) Stereoisomers – Drawing Enantiomers and assigning R-S Configurations.

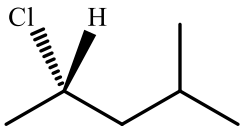


(a) Place a dot (●) on the **ONE** chiral carbon in the compound drawn at the right, and give an IUPAC name.

(b) In the boxes below, draw a zig-zag structure for each enantiomer, using **wedge and dash bonds** for the chiral carbon, AND assign the (R) and (S) configuration for each enantiomer.

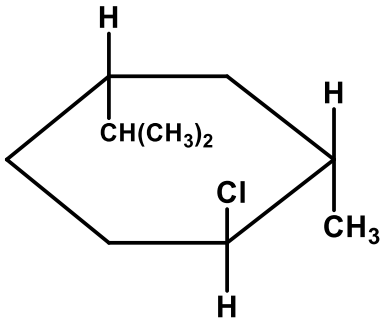
Enantiomer #1. Configuration = _____	**Enantiomer #2. Configuration = _____**

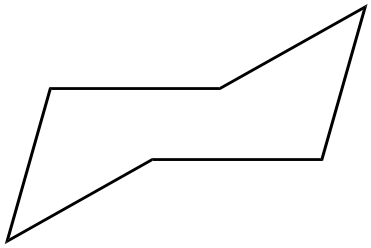
(4) Nomenclature of Enantiomers. If a name is given, draw the correct chemical structure. If a structure is given, give the IUPAC name. **Don't forget to include the proper 3D configuration at each chiral carbon (using R/S designations, or wedge/dash bonds).**

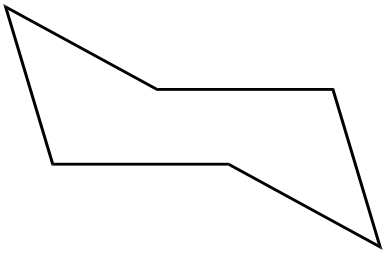
(a) 

(b) (S)-3,6-dibromo hexane

(5) REVIEW - Cyclohexane Structure (2D → 3D). Consider the 2D line structure drawn at the right. Draw the two chair conformers for this compound using the chair templates below.







CIRCLE the most stable conformer.

(6) Comparing Organic Structures. Are the following pairs of compounds:

Constitutional Isomers	Identical	Conformers	Geometric Isomers (cis/trans)