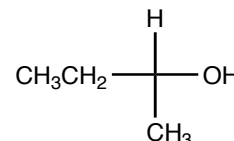
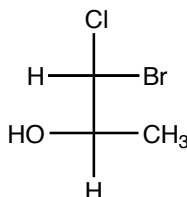
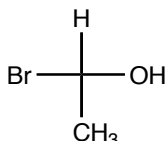
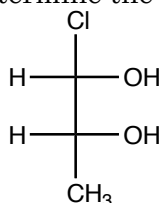


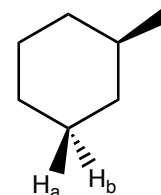
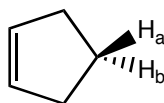
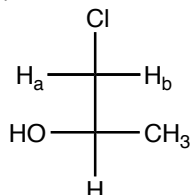
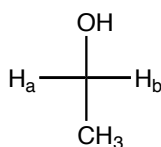
Note that this is not an all inclusive assignment. Anything that was covered in class is "fair game". Not everything on this assignment will necessarily be on the your test.

This assignment is to give you a feeling for how the questions on your test will be asked.

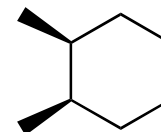
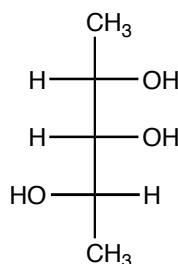
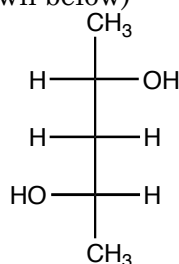
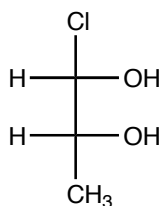
1. Determine the configurations (R or S) of the following chiral centers.



2. Identify whether the  $H_a/H_b$  pair of protons in the following molecules are homotopic, diastereotopic, or enantiotopic.



3. Which of the following compounds has a meso form (the meso form, assuming it exists, is not necessarily the one that is drawn below)



4. Identify whether the following reactions occur via syn addition, anti additions, or both.

a. reaction of HBr with alkenes

b. reaction of  $Br_2$  with alkynes

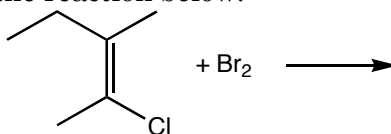
c. reaction of Na and  $NH_3$  with alkynes

d. reaction of  $Cl_2$  with alkenes

e. reaction of  $Hg(O_2CCH_3)_2$  and alkenes in water

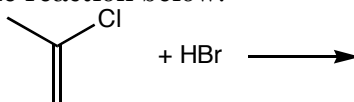
f. reaction of  $BH_3$  and alkenes

5. The following questions refer to the reaction below.



- How many chiral centers are produced in the reaction.
- Ignoring the stereochemistry of the addition reaction, how many stereoisomers are possible?
- Considering the stereochemistry of the addition reaction, how many stereoisomers form?
- Draw the stereoisomer(s) that form during the reaction.

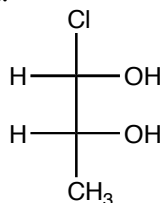
6. The following questions refer to the reaction below.



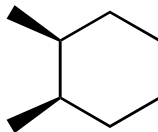
- How many chiral centers are produced in the reaction.
- Ignoring the stereochemistry of the addition reaction, how many stereoisomers are possible?
- Considering the stereochemistry of the addition reaction, how many stereoisomers form?
- Draw the stereoisomer(s) that form during the reaction.

7. Draw a diastereomer of the following materials.

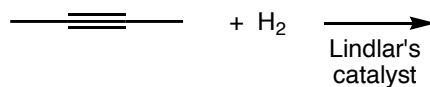
a.



b.



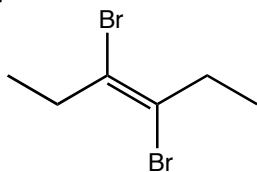
8. The following questions refer to the reaction below.



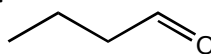
- How many chiral centers are produced in the reaction.
- Ignoring the stereochemistry of the addition reaction, how many stereoisomers are possible?
- Considering the stereochemistry of the addition reaction, how many stereoisomers form?
- Draw the stereoisomer(s) that form during the reaction.

9. Make the following compound using an alkyne and whatever reagents you need.

a.

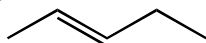


b.



10. Starting with ethyne (only alkyne that you are allowed to use) and any other reagents, make the following compounds. (Don't forget to consider stereochemistry when appropriate.)

a.



b.

