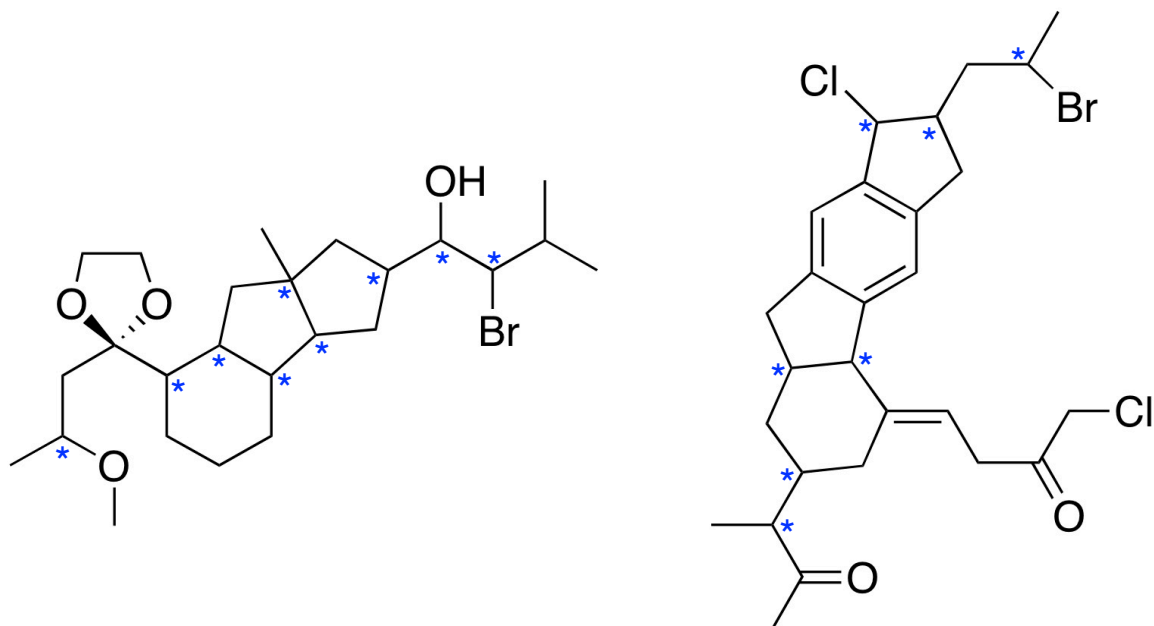
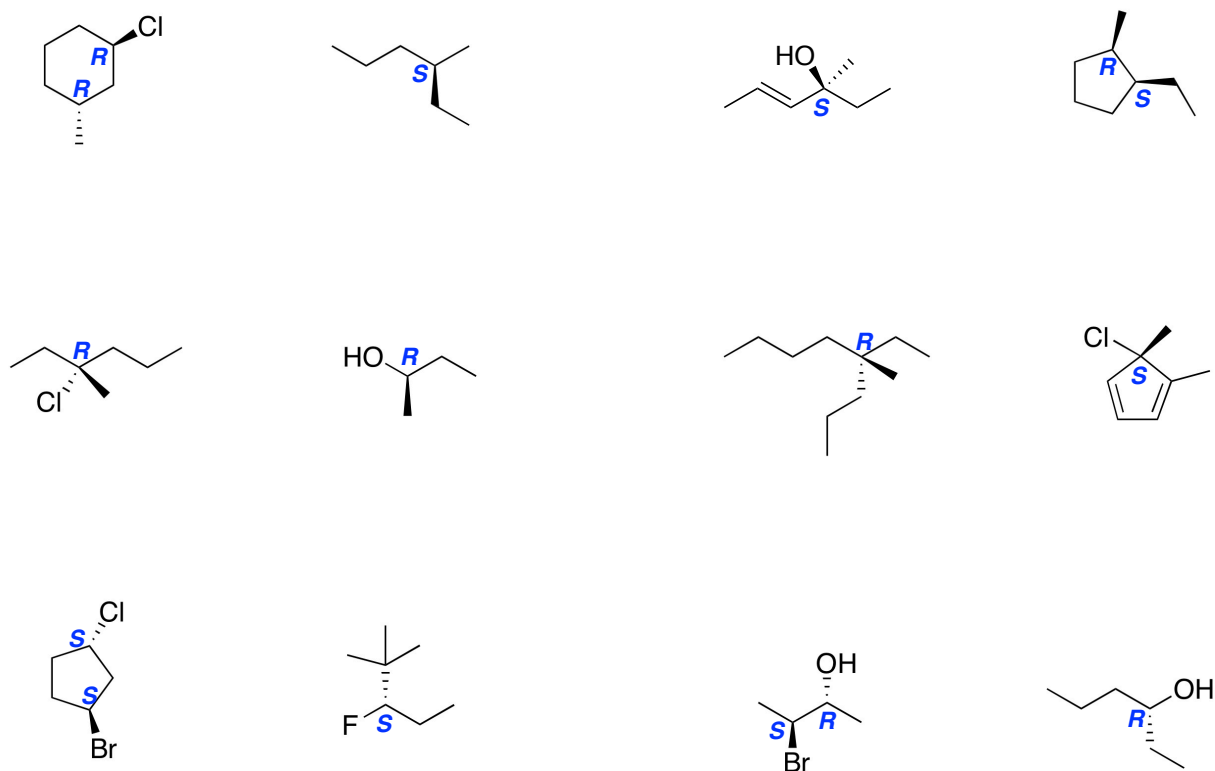


CEM 251, Problem Set 3: Chapter 3

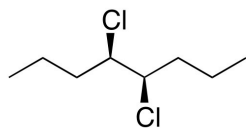
1. Use an asterisk (*) to indicate the chiral carbons in the following molecules.



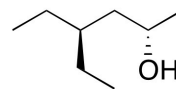
2. Determine R and S stereochemistry for all the stereocenters of the following molecules



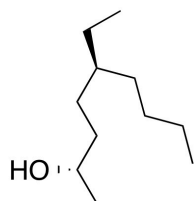
3. Give complete IUPAC names, including stereochemistry, for the following molecules:



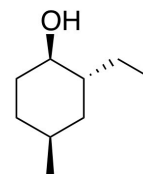
(4*R*,5*R*)-4,5-dichlorooctane



(2*S*)-4-ethyl-2-hydroxyhexane

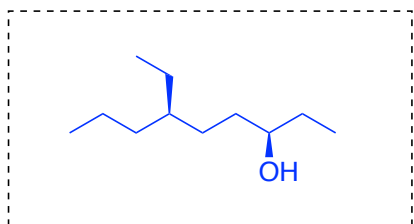


(2*S*,5*S*)-2-hydroxy-5-ethylnonane

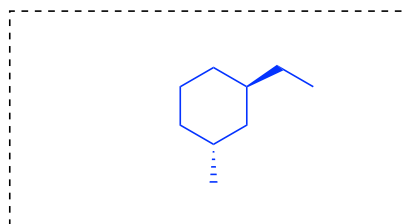


(1*R*,2*R*,4*S*)-2-ethyl-1-hydroxy-4-methylcyclohexane

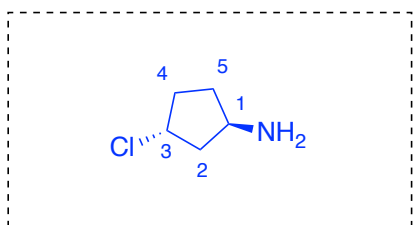
4. Provide the correct structure for the following IUPAC names:



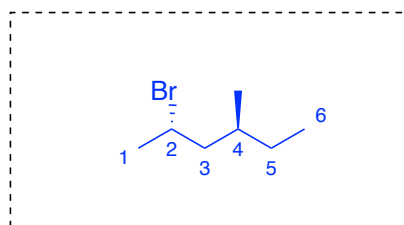
(3*R*,6*R*)-6-ethyl-3-hydroxynonane



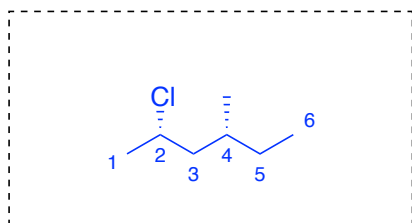
(1*R*,3*R*)-1-ethyl-3-methylcyclohexane



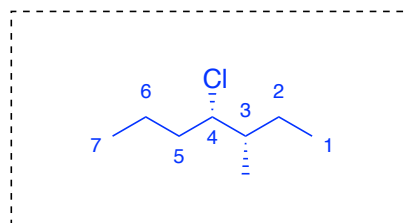
(1*R*,3*R*)-1-amino-3-chlorocyclopentane



(2*S*,4*S*)-2-bromo-4-methylhexane



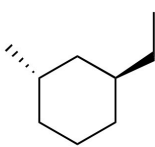
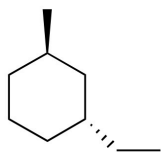
(2*S*,4*R*)-2-chloro-4-methylhexane



(3*S*,4*S*)-4-chloro-3-methylheptane

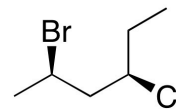
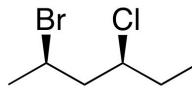
5. Indicate if the following pairs are constitutional isomers, diastereomers, enantiomers, or identical

a.



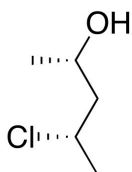
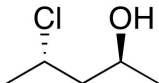
Enantiomers

c.



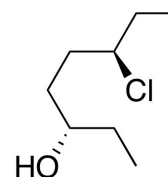
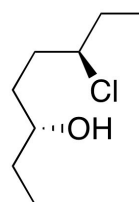
Diastereomers

b.



Identical

d.

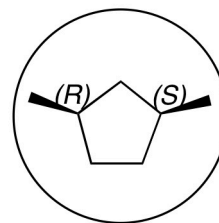
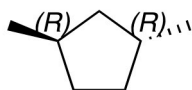


Diastereomers

6. Draw all of the stereoisomers for 1,3-dimethylcyclopentane. Label each stereocenter as R and S. If a meso compound exists, circle it.

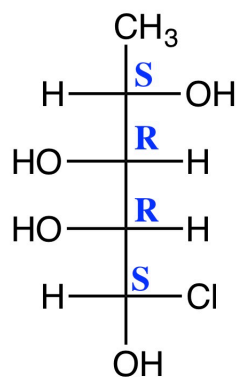
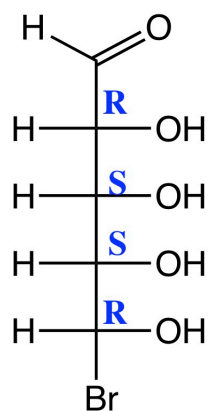


$2^2 = 4$ possible stereoisomers

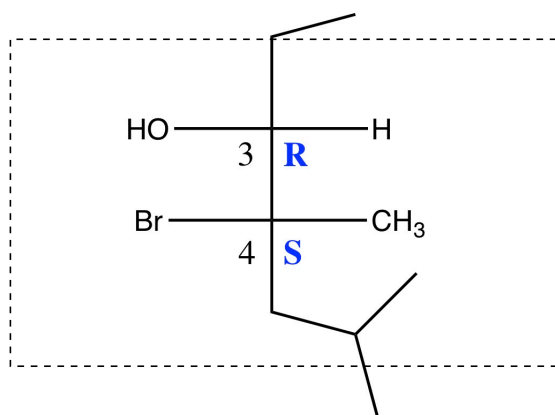
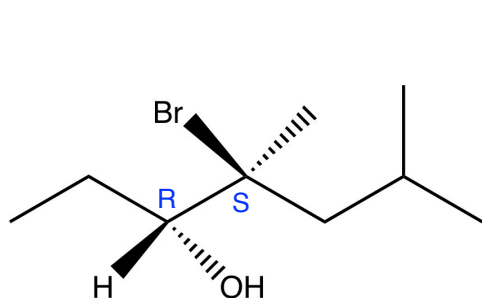


Only get three stereoisomers since one is a meso compound

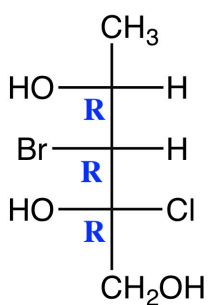
7. Determine the stereochemistry of each chiral carbon in the following molecules:



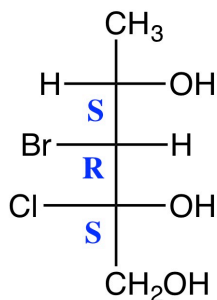
8. Convert the following molecule into a correct Fisher Projection.



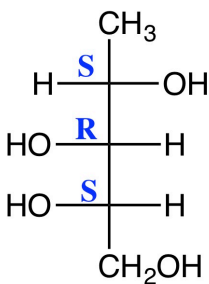
9. What is the relationship between the following pairs of molecules (Choices: Identical, Enantiomers, Diastereomers)



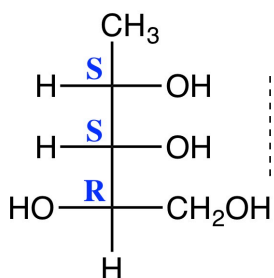
vs



Diastereomers



vs



Diastereomers