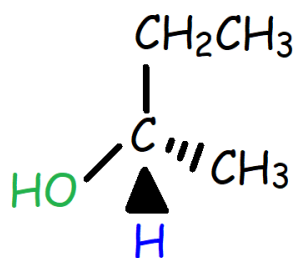
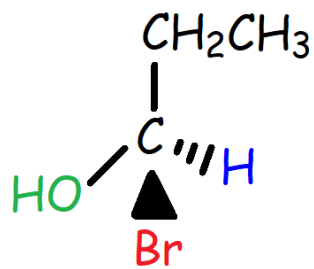
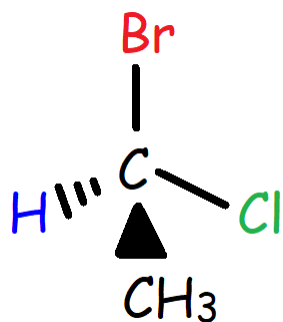
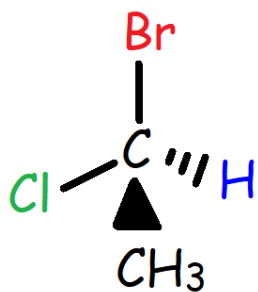


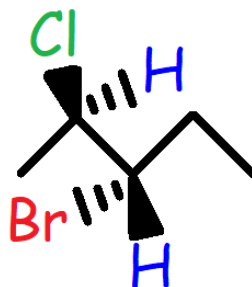
Stereochemistry Worksheet

Organic Chemistry Tutor

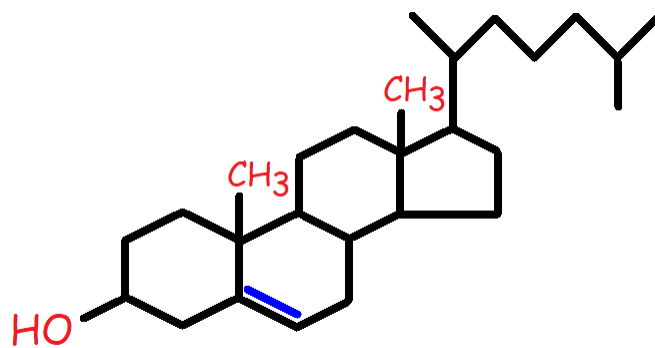
1. Assign a R or S configuration to each chiral center shown below:



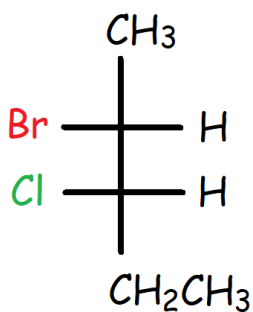
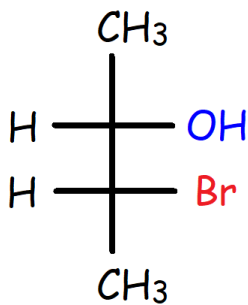
2. Name the following compounds using the R/S system for stereoisomers:



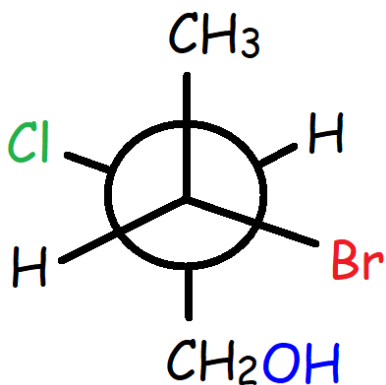
3. The chemical structure of cholesterol is shown below. How many stereoisomers are possible for this molecule?



4. Determine the absolute configuration of each chiral center and name each Fischer projection shown below:



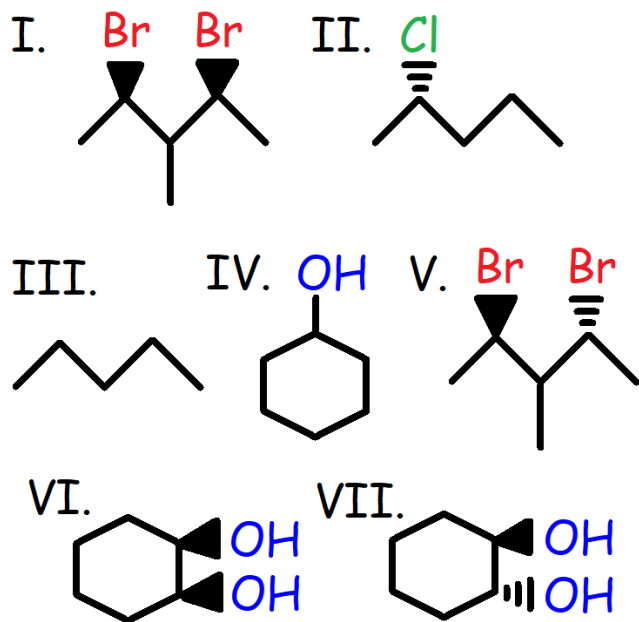
5. Assign a R or S configuration to each chiral center in the Newman projection shown below and provide an IUPAC name for the molecule:



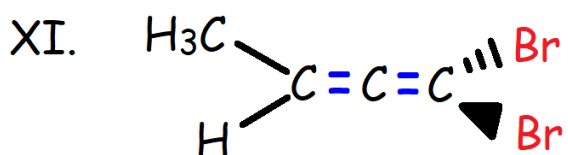
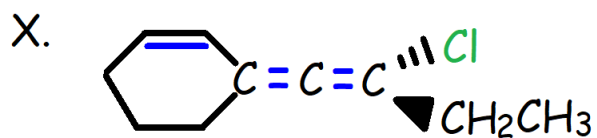
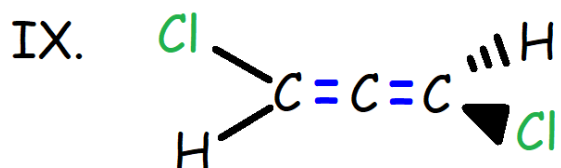
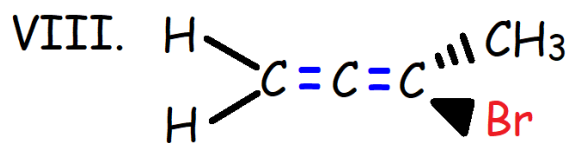
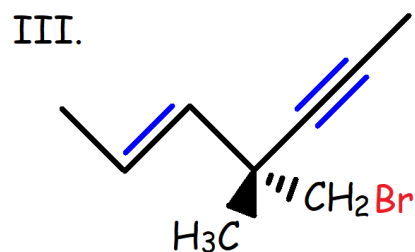
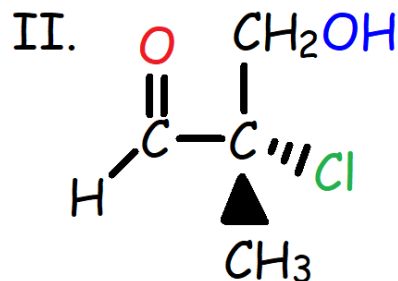
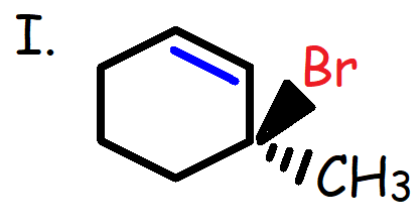
6. Draw the structure of (2R, 3S)-2-fluoro-3-methylhexane.

7. Draw all possible monochlorinated products of 3-methylpentane. (Include stereoisomers)

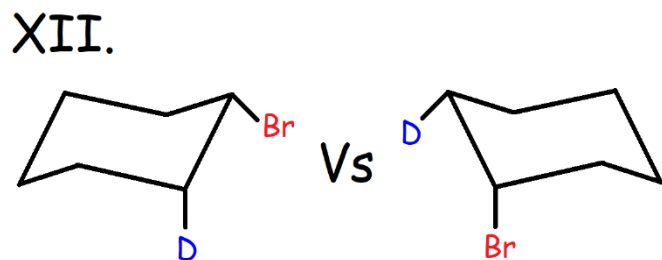
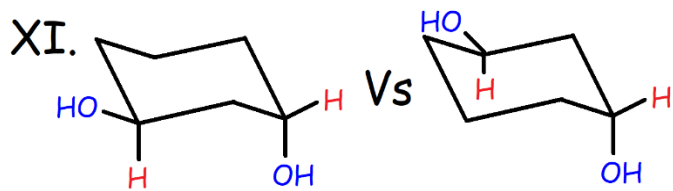
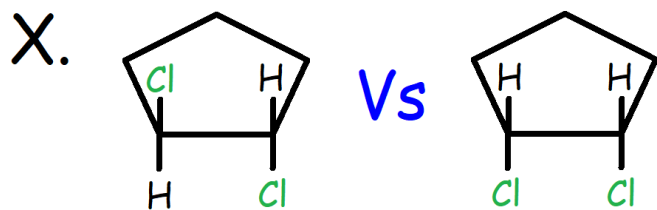
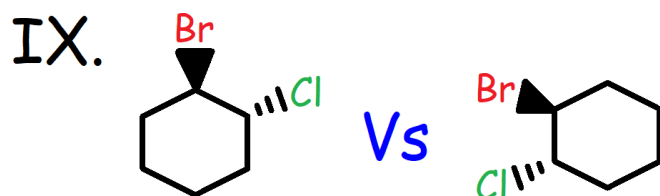
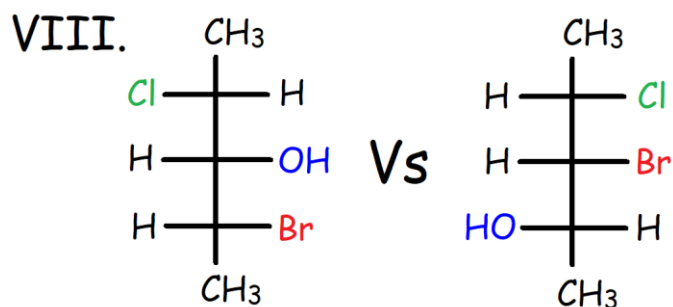
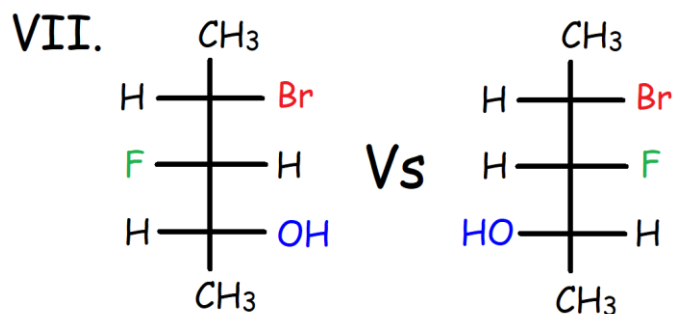
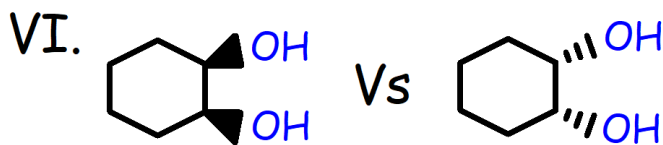
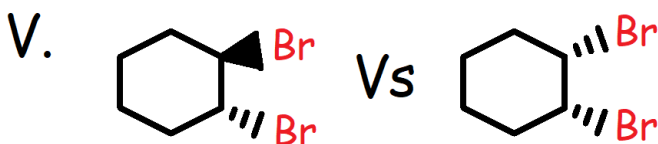
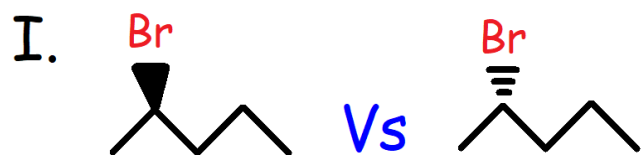
8. Is the molecule chiral or achiral?



9. Assign a R or S configuration to the chiral center(s) shown below.



10. Describe the relationship between each pair of molecules. (Enantiomers, diastereomers, conformers, meso compounds, constitutional isomers, etc.)



Answers:

1a. S

1b. R

1c. R

1d. S

2a. (S)-2-bromobutane

2b. (2R, 3S)-3-bromo-2-chloropentane

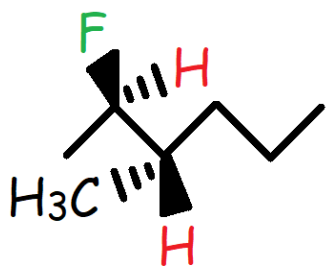
3. 256 Stereoisomers

4a. (2S, 3R)-3-bromo-2-butanol

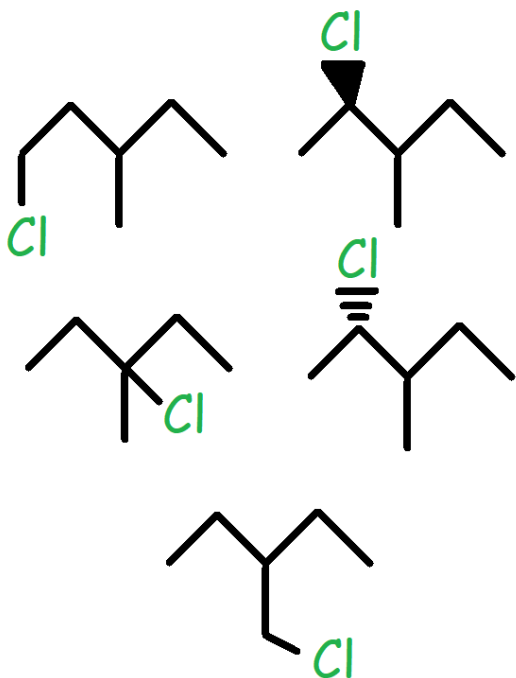
4b. (2R, 3S)-2-bromo-3-chloropentane

5. (2R, 3S)-3-bromo-2-chloro-1-butanol

6.



7.



8.
I. Achiral II. Chiral III. Achiral IV. Achiral V. Chiral VI. Achiral VII. Chiral
VIII. Achiral IX. Chiral X. Chiral XI. Achiral

9.
I. S II. S III. R

10.
I. Enantiomers
II. Constitutional Isomers
III. Different Compounds – Not Isomers
IV. Enantiomers
V. Diastereomers / Cis Trans Isomers
VI. Meso Compounds = Identical Molecules
VII. Diastereomers
VIII. Constitutional Isomers
IX. Enantiomers
X. Diastereomers / Cis Trans Isomers
XI. Enantiomers
XII. Conformers or Conformational Isomers