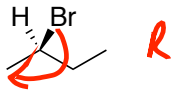
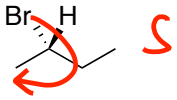
Priorities: 1. Heteroatom. 2. C-with-heteroatom.
3. C > CH > CH2 > CH3.
4. Proceed down chain until point of difference.

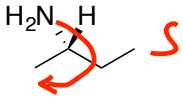
Organic Chemistry I Test 2 Extra Stereochemistry Practice Problems

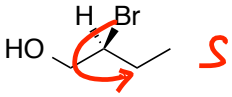
Page 1: Designate R/S Page 2: Chiral or Achiral? Page 3: Same, Enantiomer, or Diastereomer?

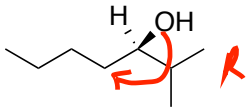
A. Designate the R/S configuration for any chiral centers in the following molecules.

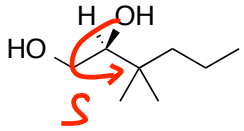
1. 

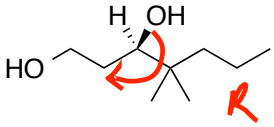
2. 

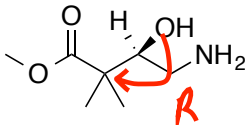
3. 

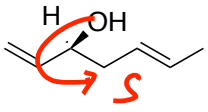
4. 

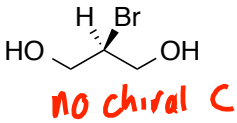
5. 

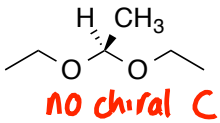
6. 

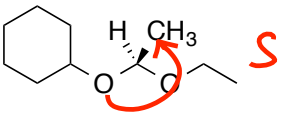
7. 

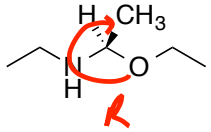
8. 

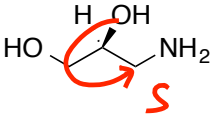
9. 

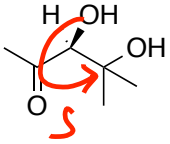
10. 

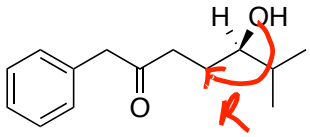
11. 

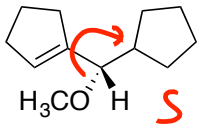
12. 

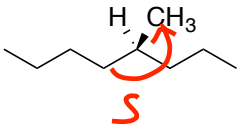
13. 

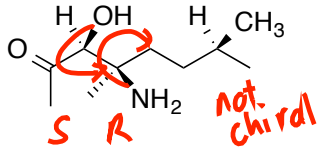
14. 

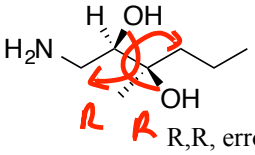
15. 

16. 

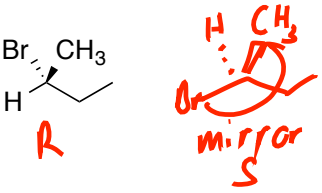
17. 

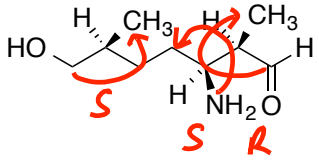
18. 

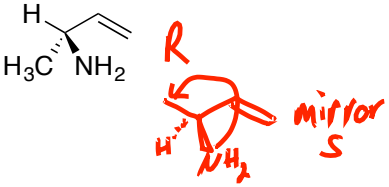
19. 

20. 

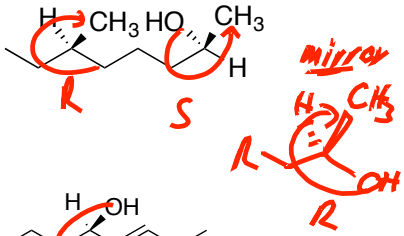
R,R, error in movie which said R, S.

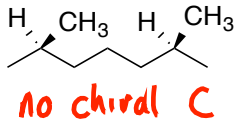
21. 

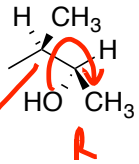
22. 

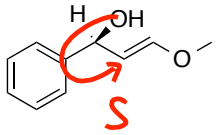
23. 

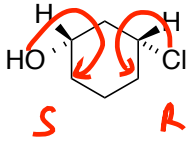
R,R

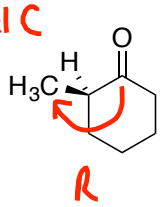
24. 

25. 

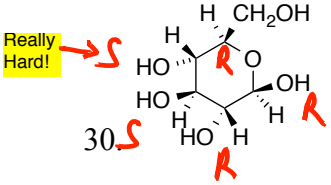
26. 

27. 

28. 

29. 

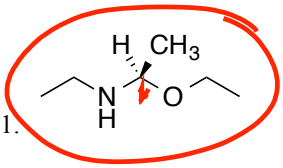
Really Hard!

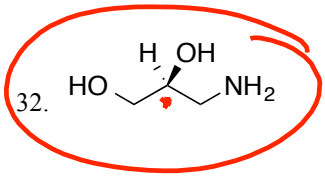
30. 

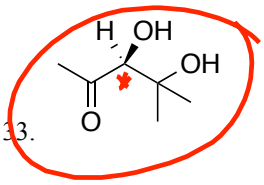
This one is very hard.
But for each of the 5 chiral C's, the tie-breaking processes do work.
The upper-left S is harder than the others.

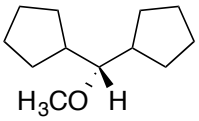
B. Identify each of the following molecule as chiral or achiral. (By circling the chiral ones.) Write "meso" where it applies. (In other words, if it is achiral despite having chiral centers).

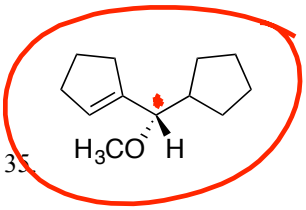
One chiral carbon => chiral molecule

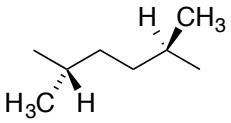
31. 

32. 

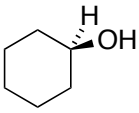
33. 

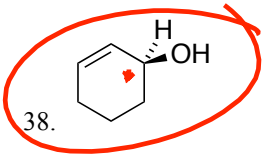
34. 

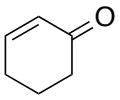
35. 

36. 

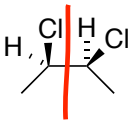
Two common attachments => achiral

37. 

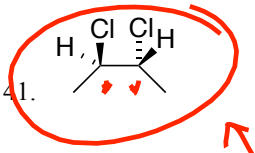
38. 

39. 

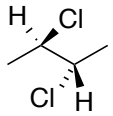
Plane of symmetry => achiral
Two common attachments => achiral

40. 

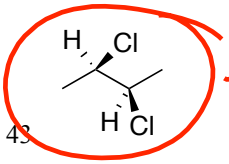
meso

41. 

equals

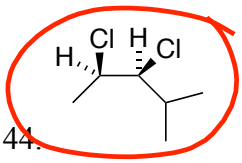
42. 

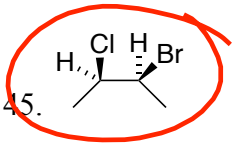
meso

43. 

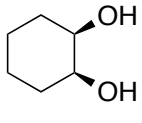
equals

Be able to rotate in order to better visualize planes of symmetry or lack thereof

44. 

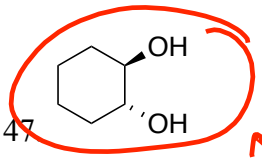
45. 

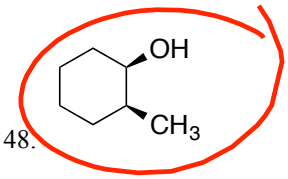
S
S
T

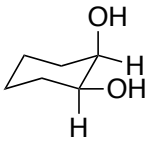
46. 

meso

equals

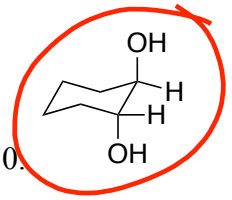
47. 

48. 

49. 

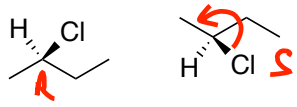
meso

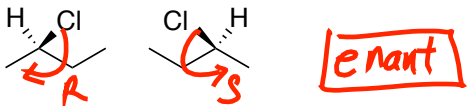
equals

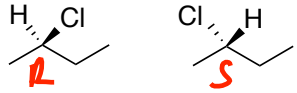
50. 

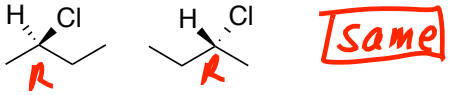
C. Mark the relationships between the following structures as either "same", "enantiomers", or "diastereomers".

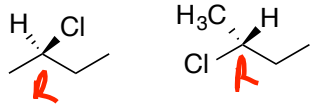
With just one chiral C, if you can assign R/S for both, you can tell if same or different.

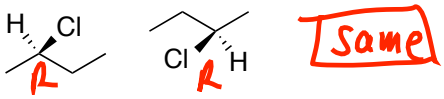
51.  enant

52.  enant

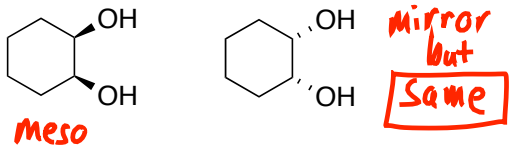
53.  enant

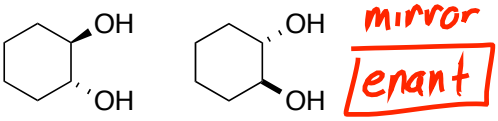
54.  same

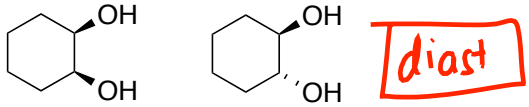
55.  same

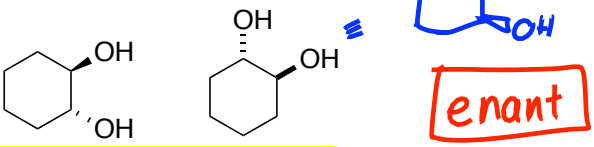
56.  same

With two chiral C's:
1. orient them the same;
2. look for all flipped (mirror) vs some flipped (not mirror, diastereomer)
3. If mirror, check for plane of symmetry (meso, achiral, mirror same) vs not (chiral, mirror is enantiomer)

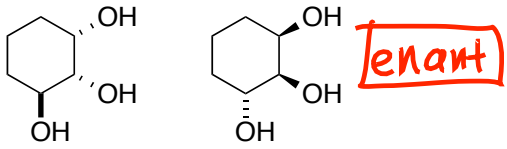
57.  meso; mirror but same

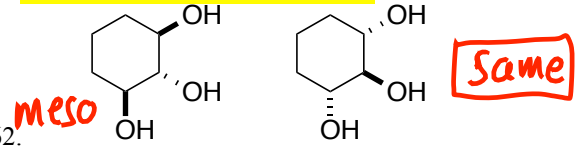
58.  mirror enant

59.  diast

60.  enant

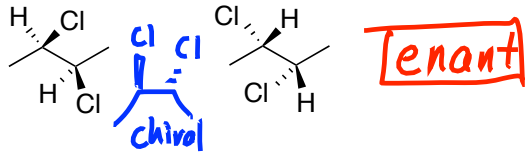
chiral => all flipped => enant

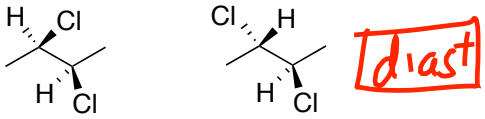
61.  enant

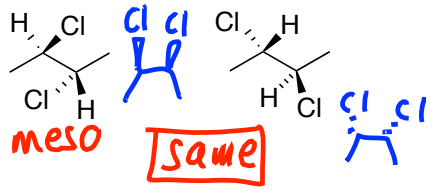
62.  meso; same

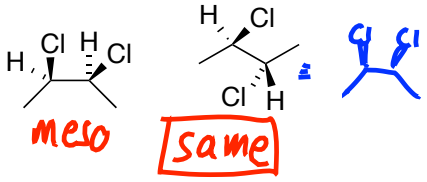
chiral => all flipped => enant

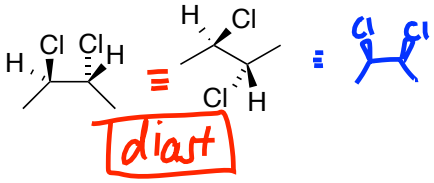
achiral => all flipped => same

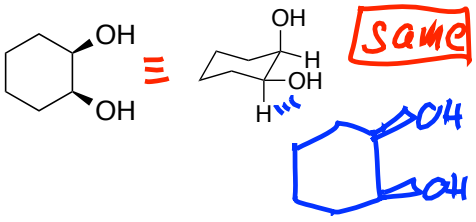
63.  chiral; enant

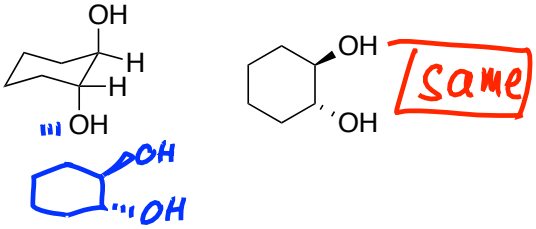
64.  diast

65.  meso; same

66.  meso; same

67.  diast

69.  same

70.  same