Organic Chemistry I

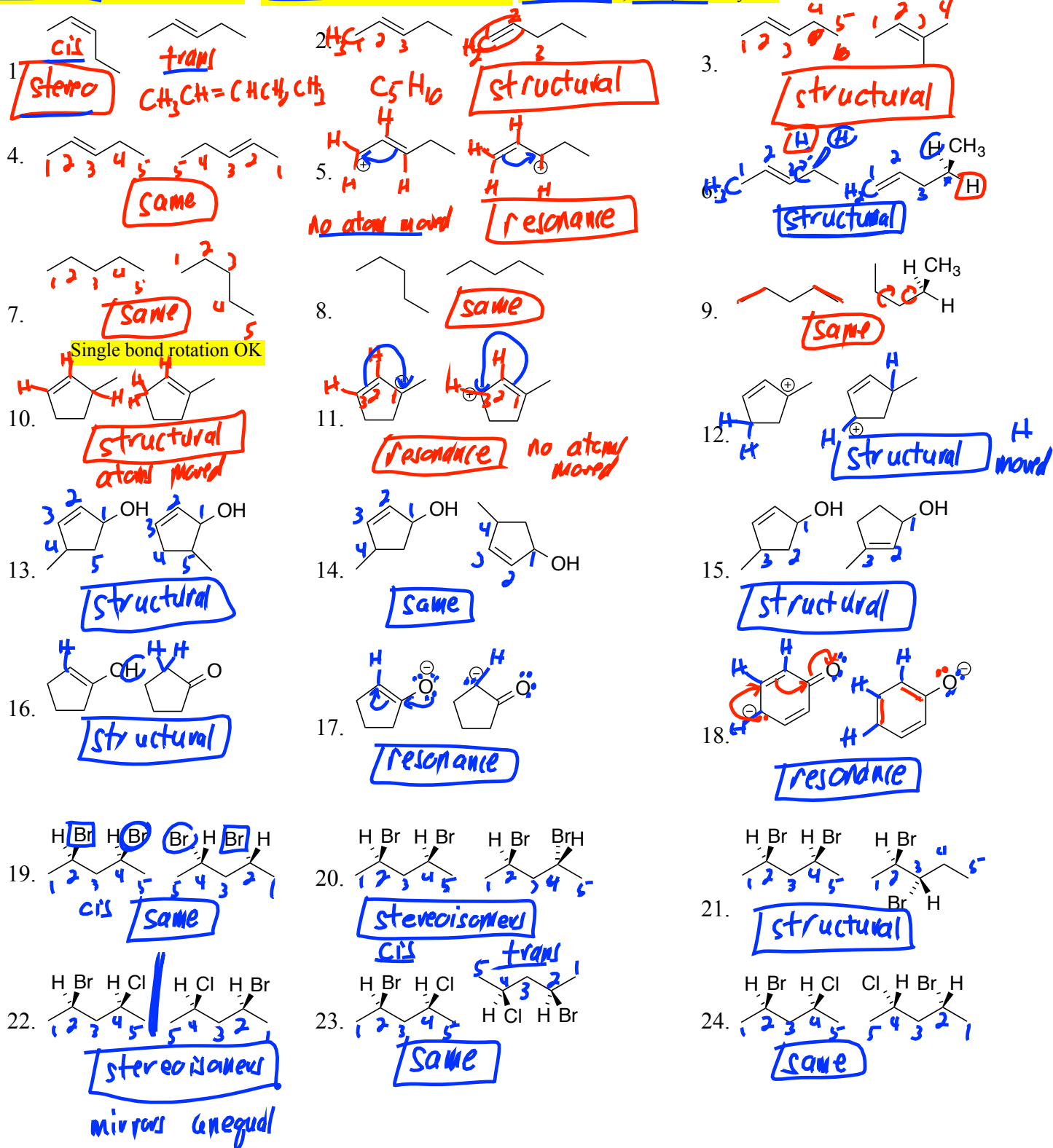Test 1   Isomers/Resonance Recognition Practice.

Note: You should be able to practice the first page fairly early during the class lectures.
- The second page you won't be able to process until almost the end, after contr~~~~ dealing with Newman Projections and Cyclohexane Chair conformations.

(highlighted note, red:) Same name, condensed formula. But atoms can't be superimposed, even by single bond rotation. Two families: 1. Unequal mirror images (enantiomers) 2. Cis/trans (diastereomers)

For the following pairs, classify the relationship between each pair as either:
- same compound
- structural isomers
- resonance structures
- stereoisomers

(highlighted notes:)
Remember, single bonds can rotate, but double bonds can't.
Different condensed formula, Different name
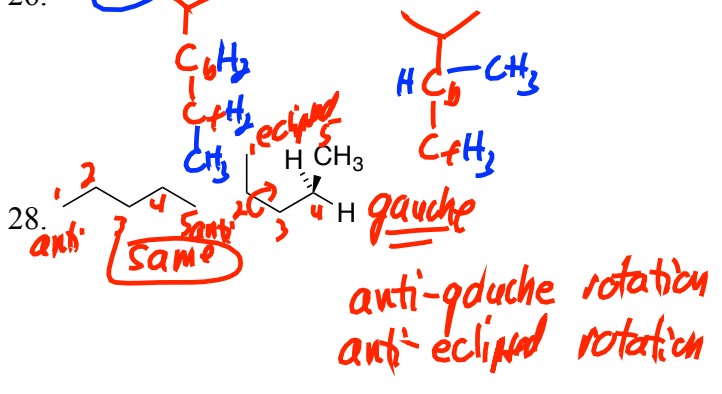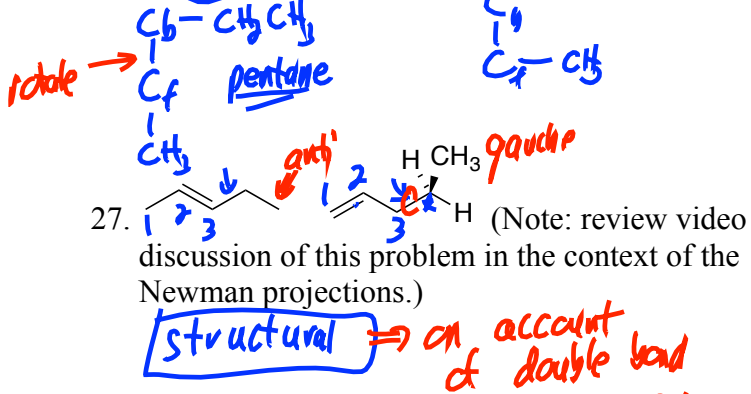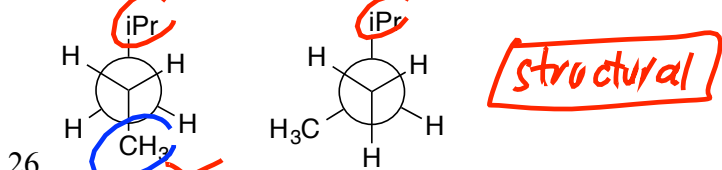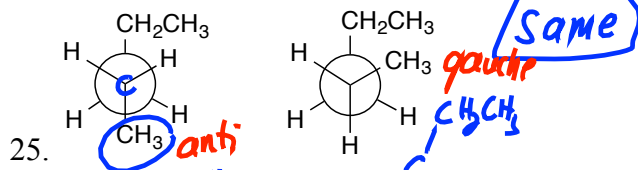No atoms move. Formal charge, double bonds, lone pairs may.

(Handwritten answers by problem:)
1. Stereo — cis / trans — $CH_3CH=CHCH_2CH_3$
2. structural — C_5H_{10}
3. structural
4. same
5. no atom moved / resonance
6. structural
7. same — Single bond rotation OK
8. same
9. same
10. structural — atoms moved
11. resonance — no atoms moved
12. structural — moved
13. structural
14. same
15. structural
16. structural
17. resonance
18. resonance
19. cis — same
20. stereoisomers — cis / trans
21. structural
22. stereoisomers — mirrors unequal
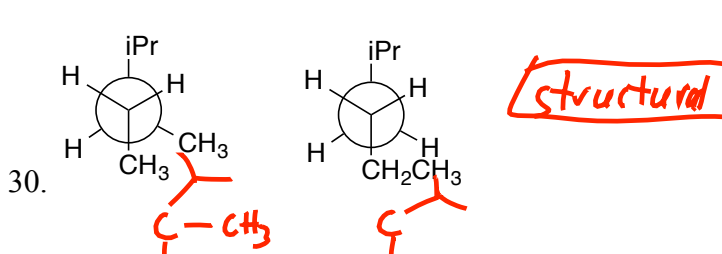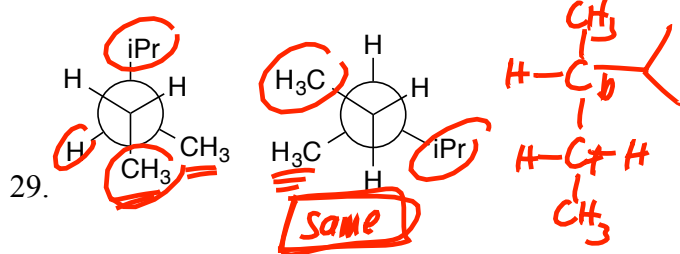23. same
24. same

Newman

For the following pairs, classify the relationship between each pair as either:

- same compound
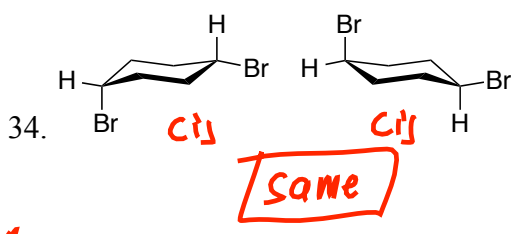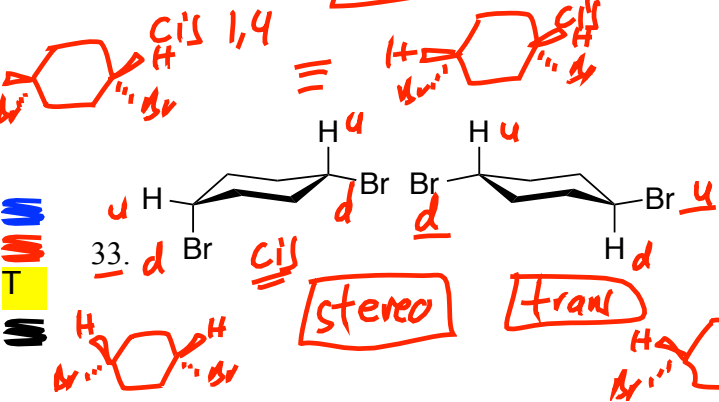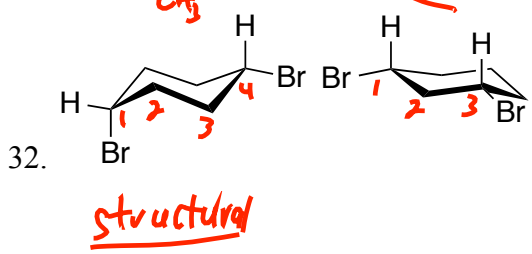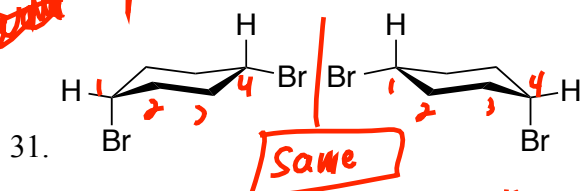- structural isomers
- resonance structures
- stereoisomers

This worksheet page contains hand-drawn Newman projections and cyclohexane chair structures for problems 25–36 with student annotations (answers such as "Same", "structural", "stereo", "trans", "cis", "gauche", "anti", "eclipsed", "pentane", "Cyclohexane", etc.).

25.

26. structural

27. structural ⇒ on account of double bond (Note: review video discussion of this problem in the context of the Newman projections.)

28. Same — anti-gauche rotation, anti-eclipsed rotation

29. Same — Cyclohexane

30. structural

31. Same — cis 1,4

32. structural

33. stereo / trans — cis

34. Same — cis

35. Same

36. cis / trans — stereo