

Name: _____

CHEMISTRY 3311, Fall 2001
Professor Walba
Second Hour Exam
October 25, 2001

scores:

- 1) 25
- 2) 25
- 3) 25
- 4) 25

This is a closed-book "open model" exam. You may use models, but no notes or books. Please put all your answers on the test. Use the backs of the pages for scratch.

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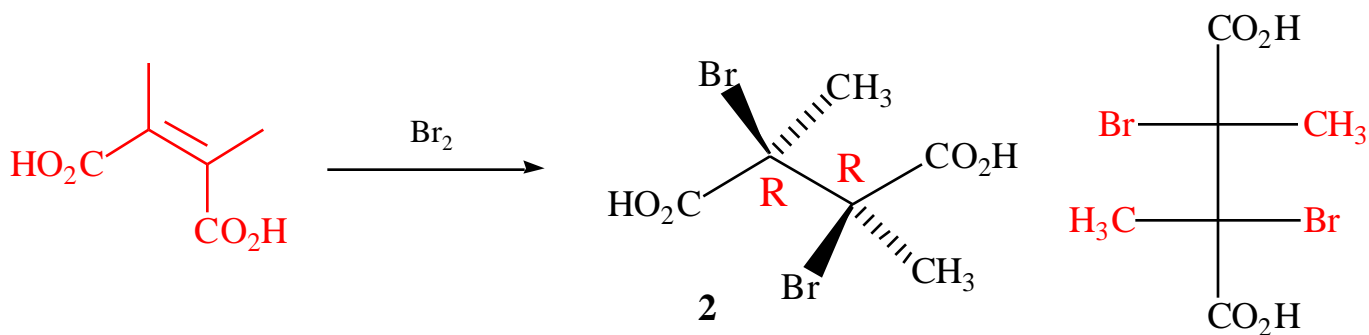
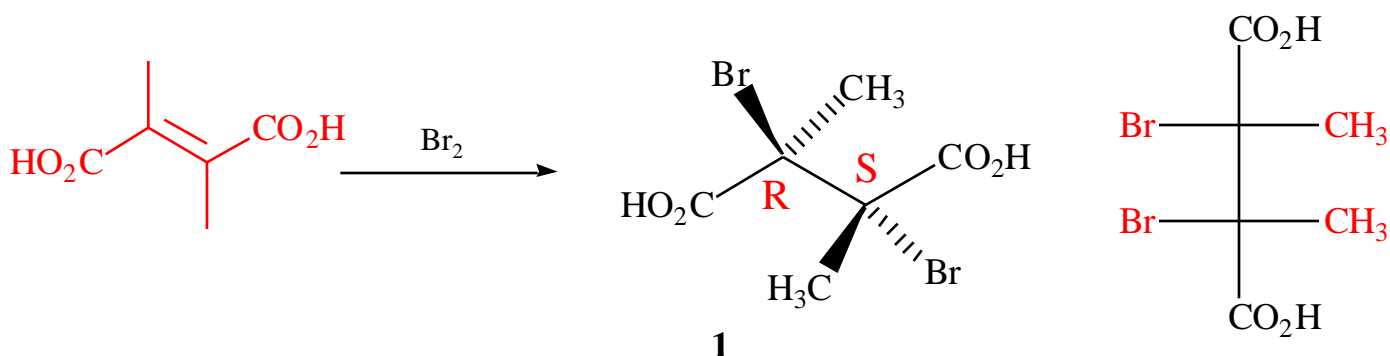
PLEASE read the questions carefully!

Partial Periodic Table

1A							8A
1 H	2A	3A	4A	5A	6A	7A	2 He
3 Li	4 Be	5 B	6 C	7 N	8 O	9 F	10 Ne
11 Na	12 Mg	13 Al	14 Si	15 P	16 S	17 Cl	18 Ar
							35 Br
							53 I

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1) (25 pts) a) Complete the reactions below. That is, draw the structures of the **starting materials** that would give products **1** and **2** by bromination.



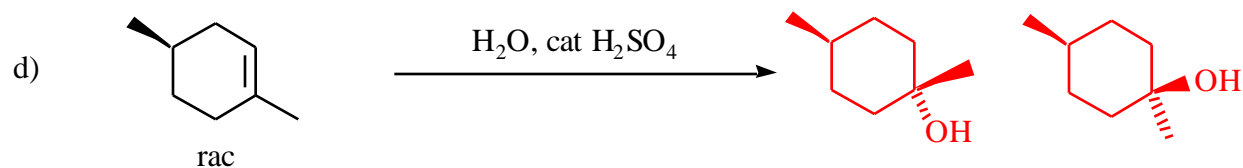
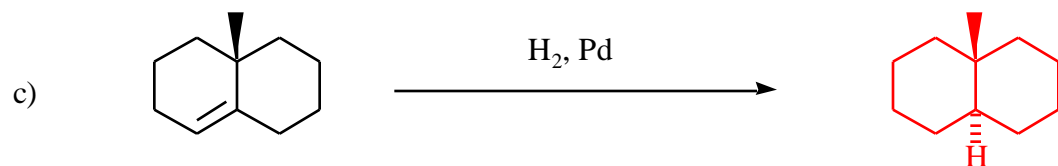
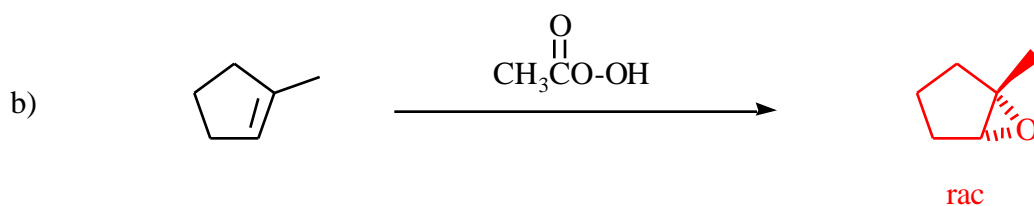
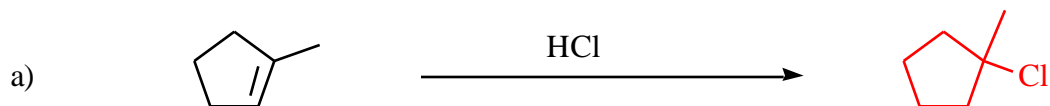
b) Which of the two dibromides is formed as a racemate (**1** or **2**)? **2**

c) On my drawings, indicate the configuration of each stereogenic center in both molecules using the R/S system. Make sure it's clear which label goes with which stereogenic center.

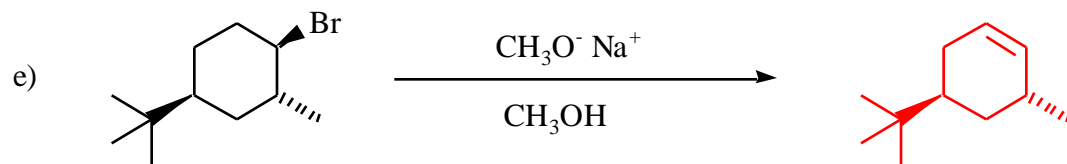
d) Complete the Fischer projections for each structure.

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2) (25 pts) Give the single major product of each of the following reactions. Show the stereochemistry of the product using wedges and dashes where appropriate. If a racemate is formed, show only one enantiomer, and label it "rac."

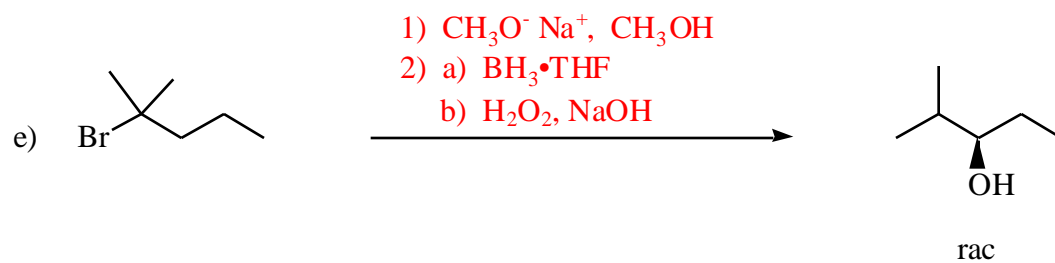
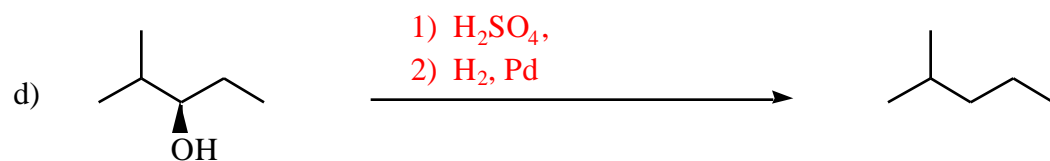
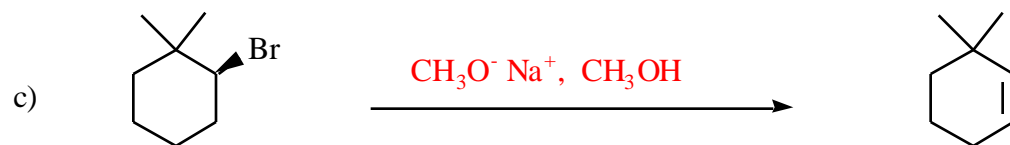
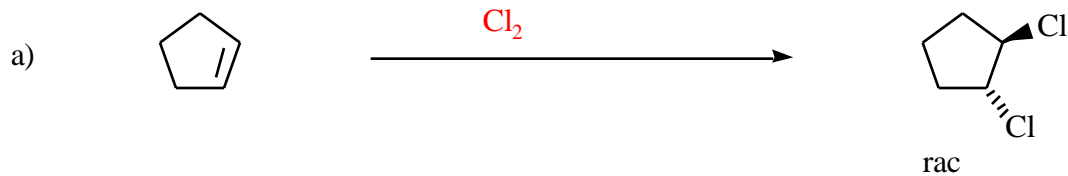


Give 2 major products for reaction d.



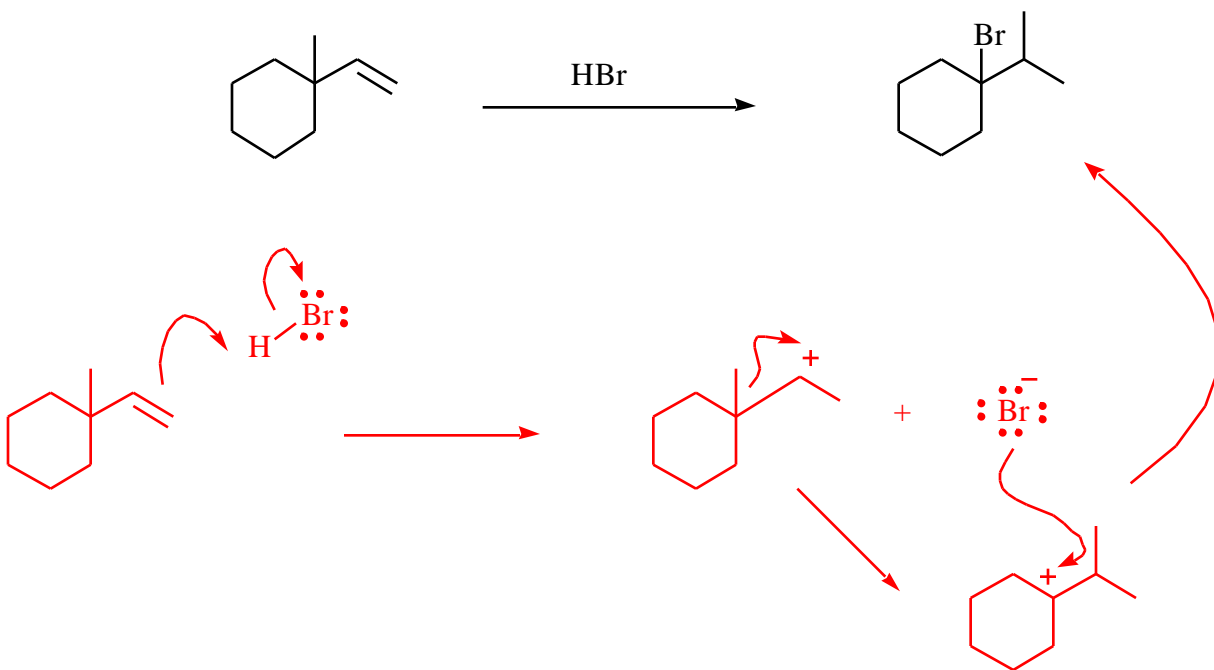
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3) (25 pts) Propose reagents for accomplishing the following transformations. NOTE: more than one step may be required! Try to make your synthesis efficient (i.e. the desired product should be the major product). You must use the starting material given, and you may use any other reagents you need.

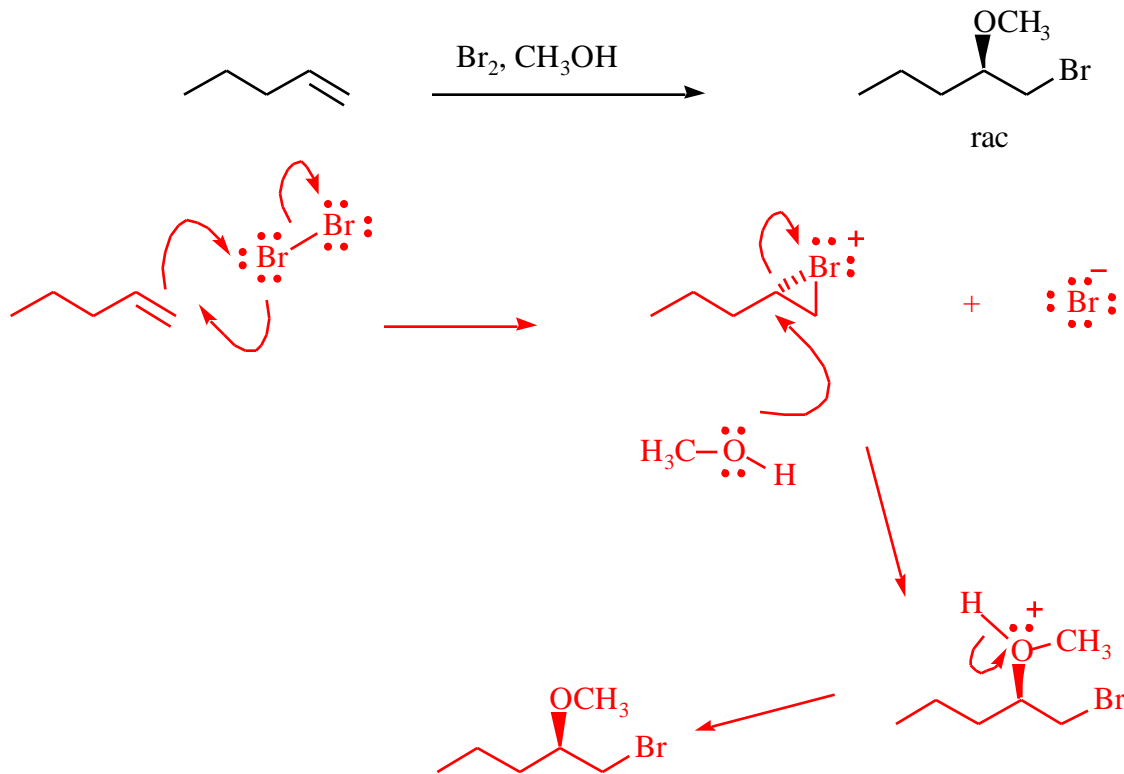


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4) (25 pts) a) Propose an arrow-pushing mechanism for each of the following transformation. Carefully show every intermediate in your mechanisms, with all lone pairs and formal charges.



b) Alcohols behave very similarly to water in many organic reactions. Given this hint, propose an arrow-pushing mechanism for the following transformation.



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4 –continued-

c) [5 point hard question!] When the 5-hydroxy-pent-1-ene (**1**) is allowed to react with bromine, one might expect a dibromide to be formed. In this case, however, the product, formed in high yield, has only ONE bromine (Molecular Formula = C_5H_9BrO). It is also found that the product has no -OH group. Propose a structure for this product.

