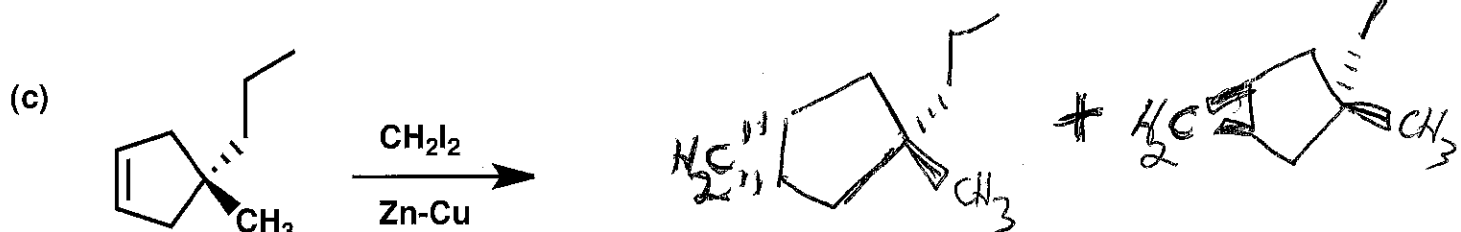
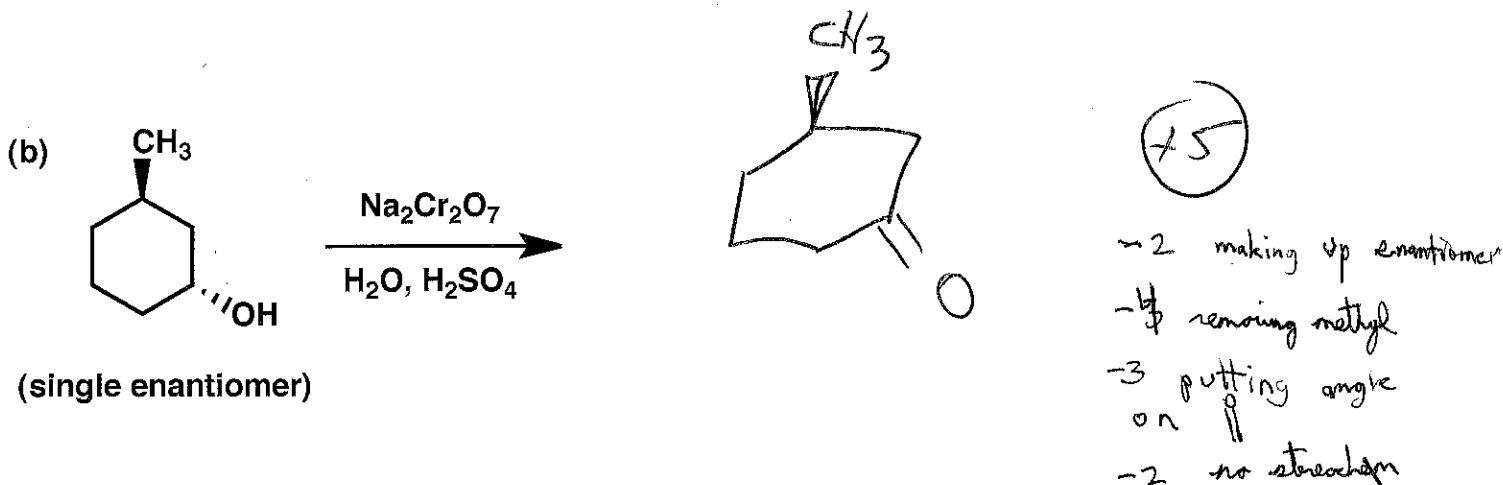
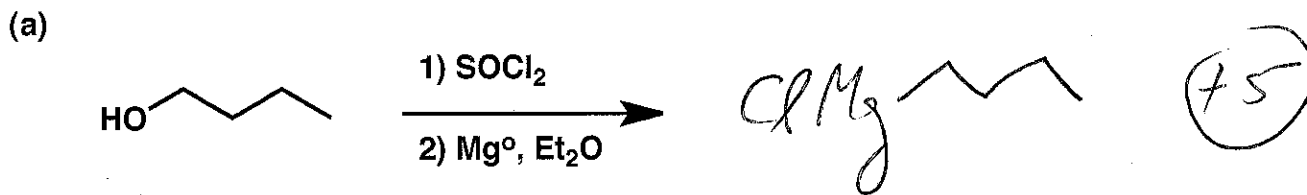


General Instructions:

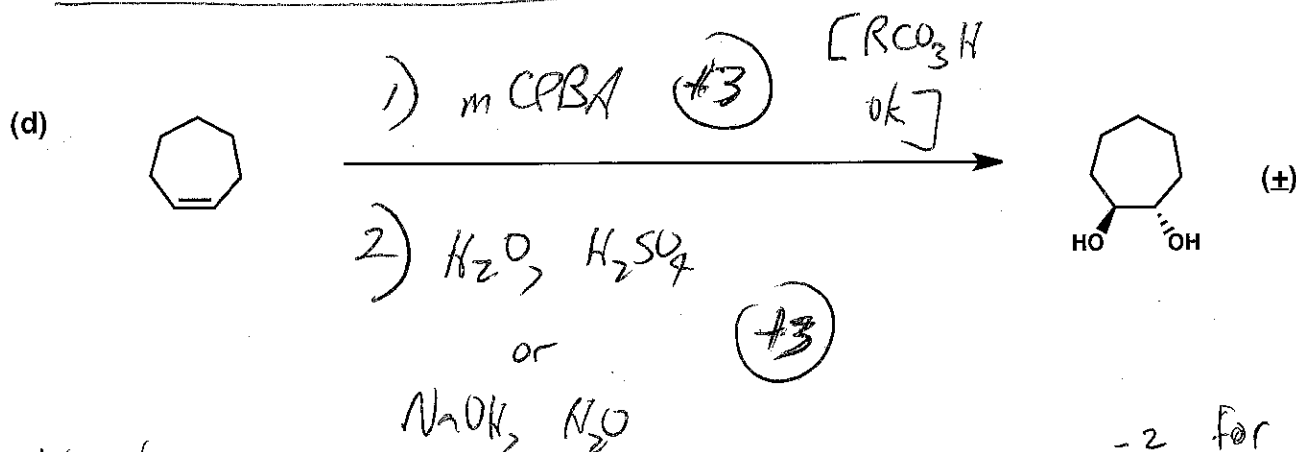
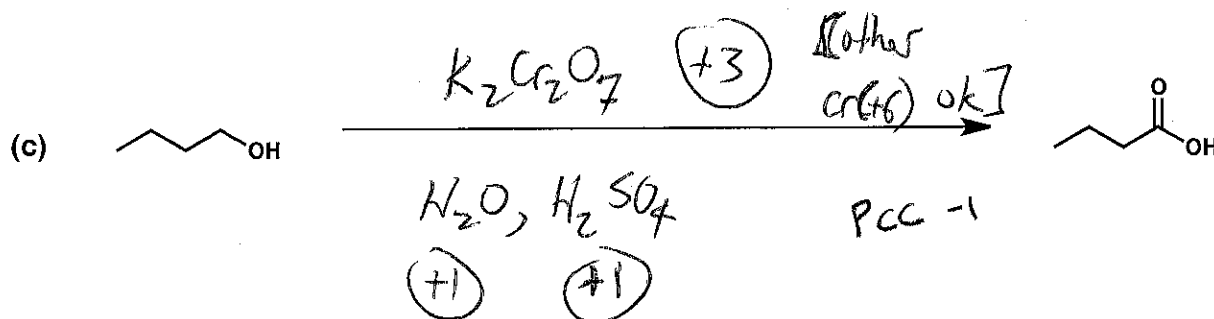
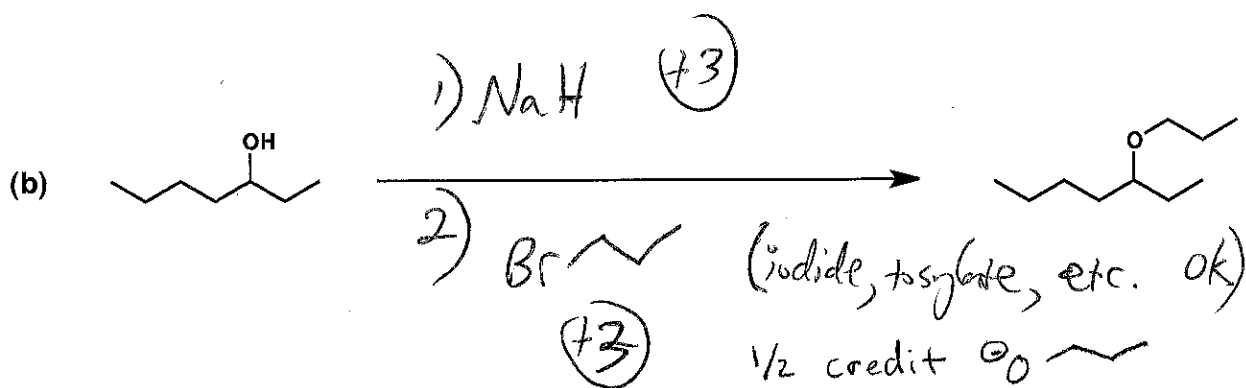
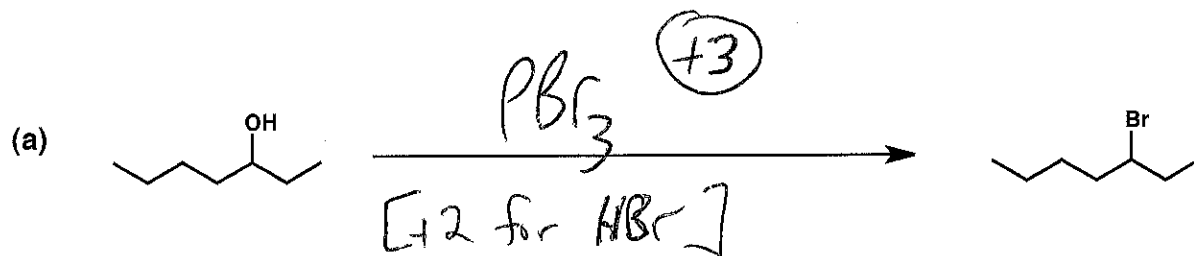
- (i) Use scratch paper at the back of the exam to work out answers; final answers must be recorded at the proper place on the exam itself for credit. Models are allowed.
- (ii) Print your name on each page.
- (iii) Please keep your paper covered and your eyes on your own work. Misconduct will lead to failure in the course.

1. (17 points) Show the major product(s) expected from the reactions below.



-2 moving substituents; -1 adding enantiomers
 +4 for one; +7 for both
 (-1 for "racemic")
 (+12 only for no cyclopropane stereochem)

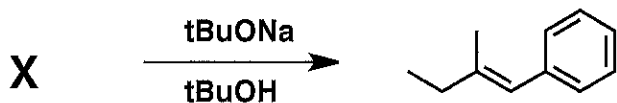
2. (20 points) Show the reagents required to convert the starting molecule to the indicated product. If necessary, be sure to differentiate clearly between distinct steps, by using "1)", "2)", etc. over the arrow.



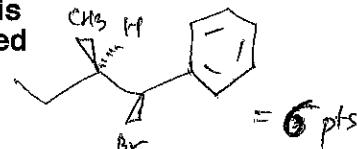
No credit if extra reagents added that would destroy rxn

-2 for not specifying 1) or 2) or unnecessary 1) or 2)

3. (6 points) Draw the structure of molecule X in the box, based on the result of the reaction indicated below.

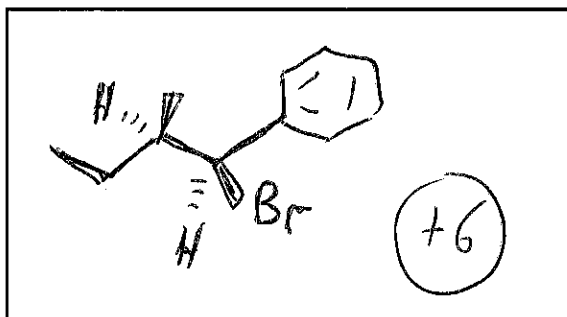


(The molecule shown is the only product formed from X.)



(C₁₁H₁₅Br)

X =



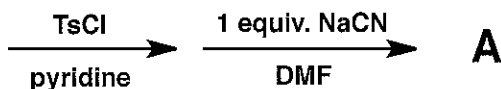
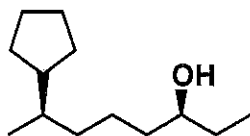
(or enantiomer)

2 pts → no stereochemistry
 ↘ incorrect stereochemistry

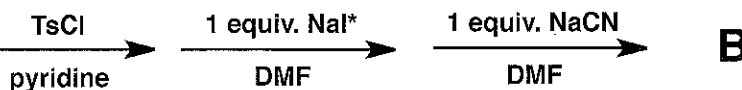
incorrect positioning = ∅

4. (14 points)

(a) Draw the structures of molecules A and B in the appropriate boxes. A and B are isomers.

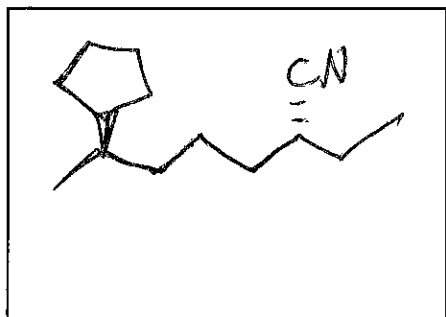


(Single enantiomer)

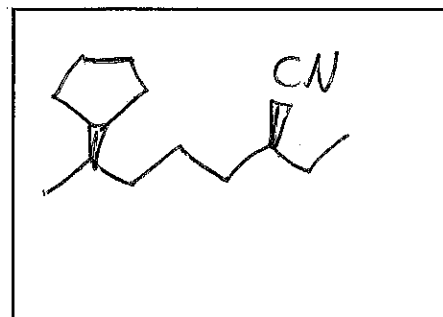


(* NaI = "sodium iodide")

A =



B =



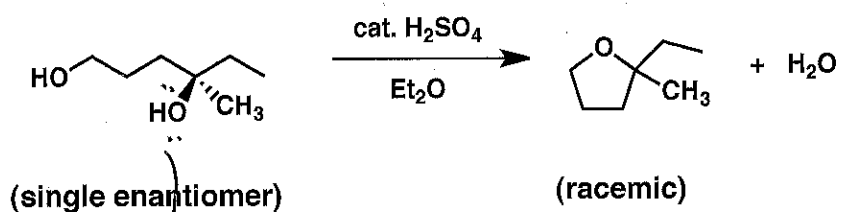
(b) Please fill in the blank: Isomeric relationship between A and B = Diastereomers.

consistent w/ their answers

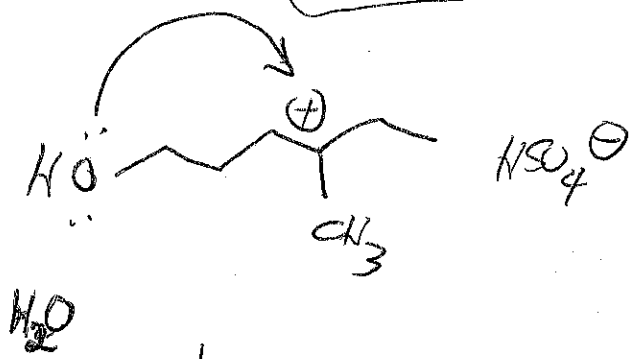
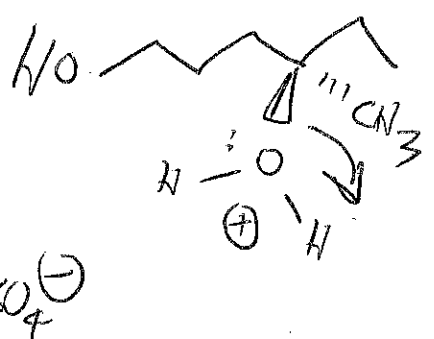
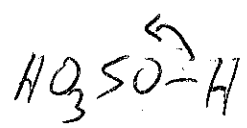
(+2) (+4)

Spelling error but makes sense (+2)

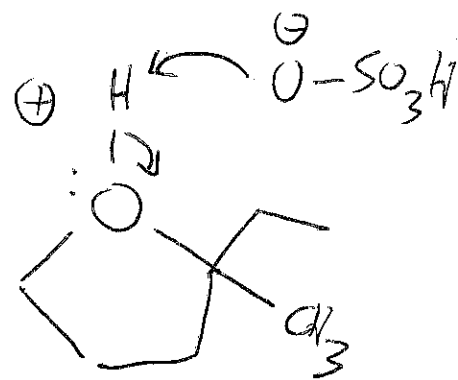
5. (14 points) Provide a mechanism (curved arrows) for the reaction below. Your mechanism must account for the stereochemical aspects of the reaction.



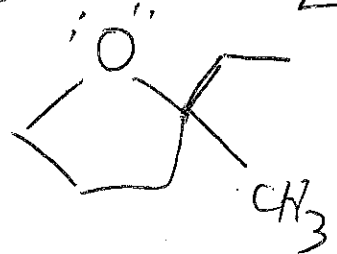
+2
 [ok if C⁺ drawn planar]
 Stereochemical information lost here (C⁺ is planar)



+1 for each curved arrow
 (+6 total)
 +2 for each intermediate
 (+6 total)



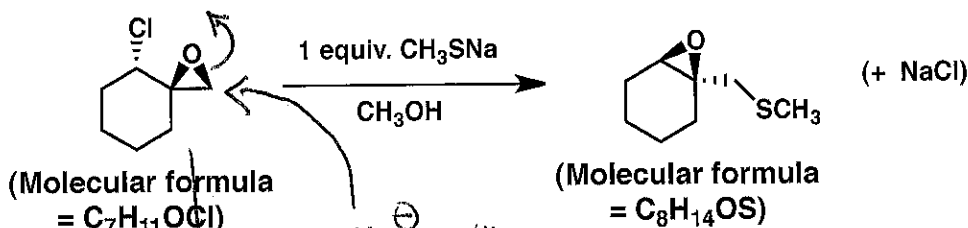
6 arrows
 3 intermediates



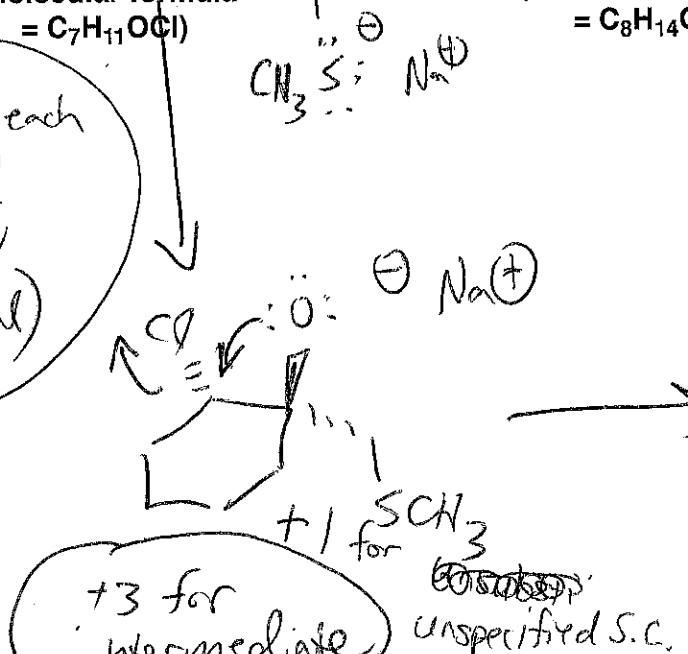
6. (16 points)

Name _____

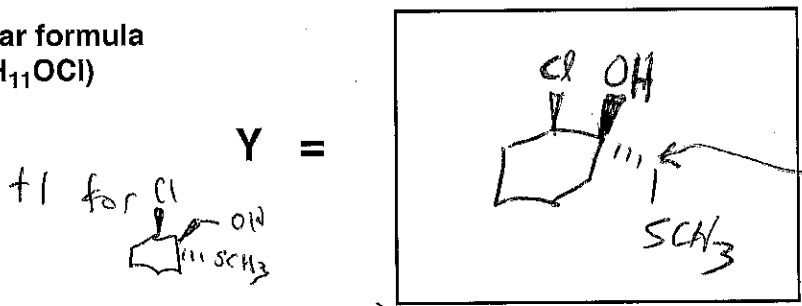
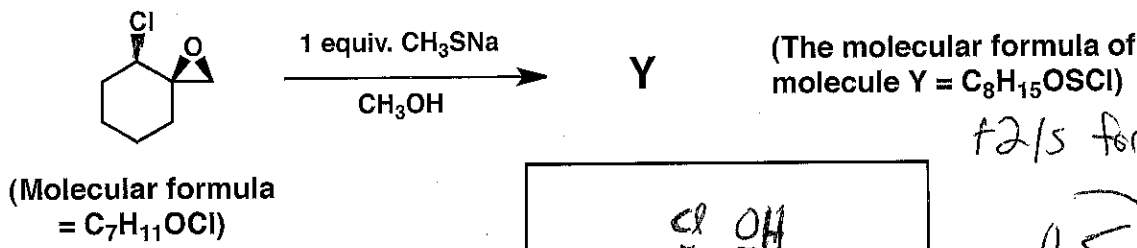
(a) Provide a mechanism (curved arrows) for the reaction below.



+1 for each curved arrow (+4 total)



(b) Indicate the structure of molecule Y in the box based on the information given below.



+2/5 for unspecified S.C.
 +5
 +4/5 unprotonated
 +3/5 if CH2 is missing but all else correct

(c) Briefly (no more than two sentences) explain why molecule Y retains a chlorine atom but the product of the reaction shown in part (a) does not.

+2 for saying it has to do w/ S.C. but not specific

Formation of final epoxide in part (a) requires backside attack on C bonded to Cl. Backside attack is not possible in (b) because of the ring.

+7

Name _____

7. (13 points) Suggest a synthetic route (i.e., a specific sequence of reactions) that would be expected to produce the "target" molecule from the indicated starting material. You may use any reagents in your proposed route. Try to reach the target with the fewest possible reactions, and try to choose reactions that are as selective as possible for one target (rather than a mixture of targets).

