

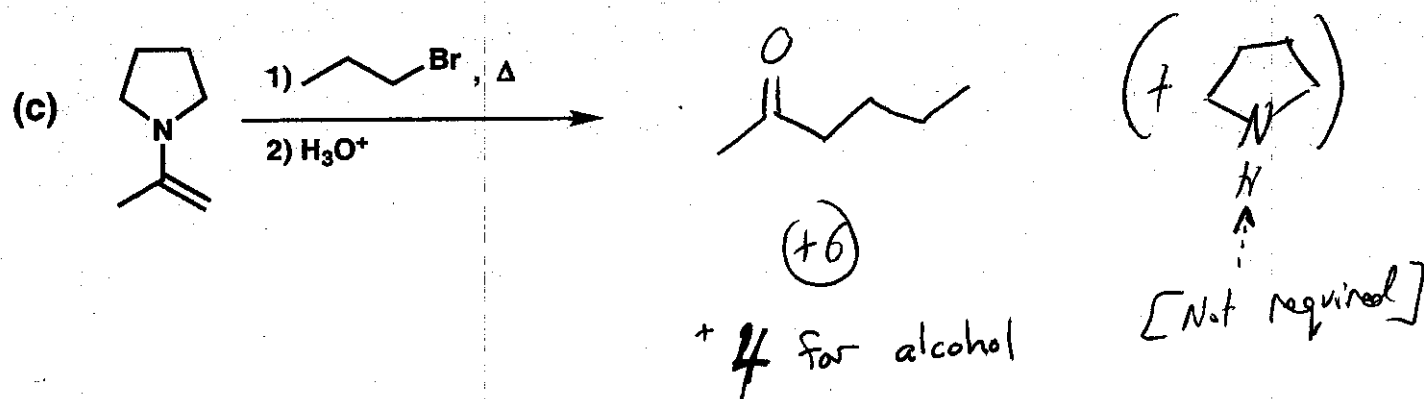
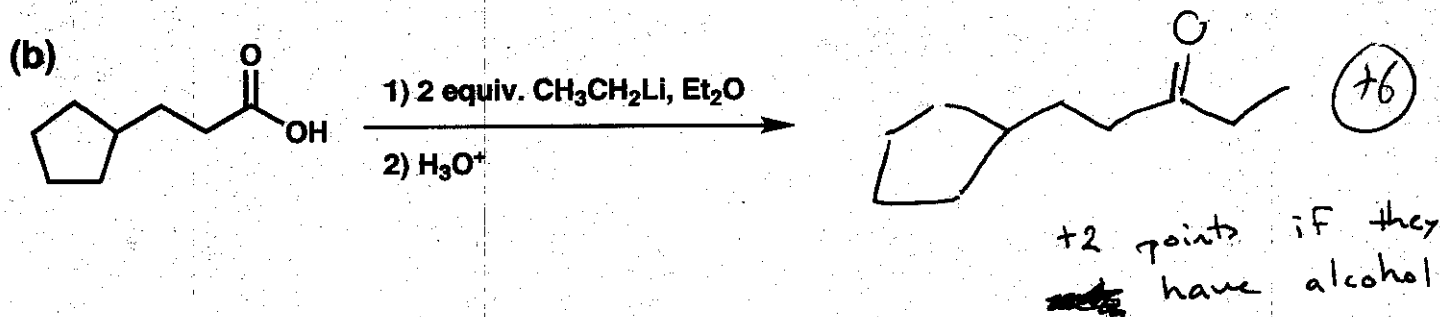
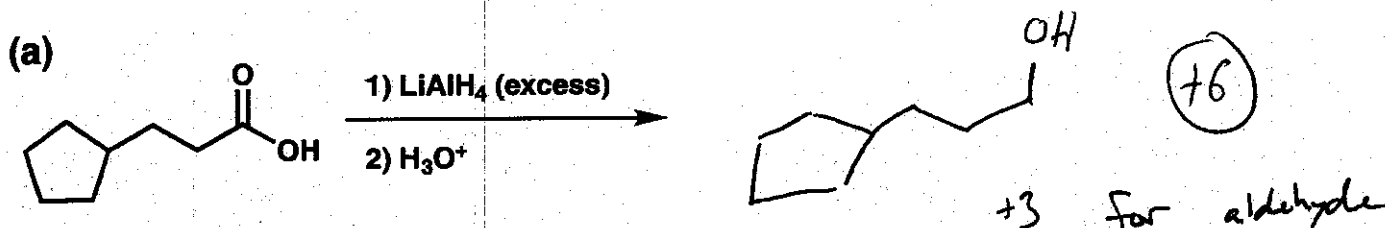
Last Name Answer

First Name Key

8

[Use scratch paper at back of exam to work out answers; final answers must be recorded at the proper place on the exam itself for credit.]

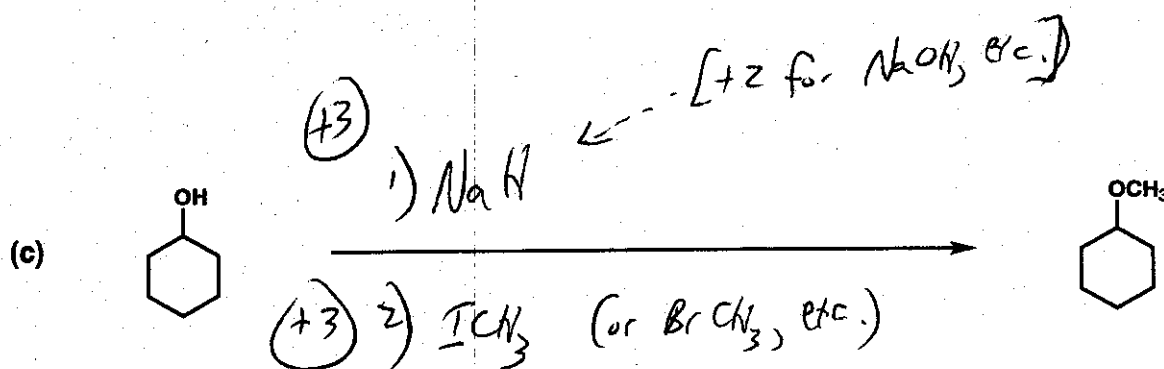
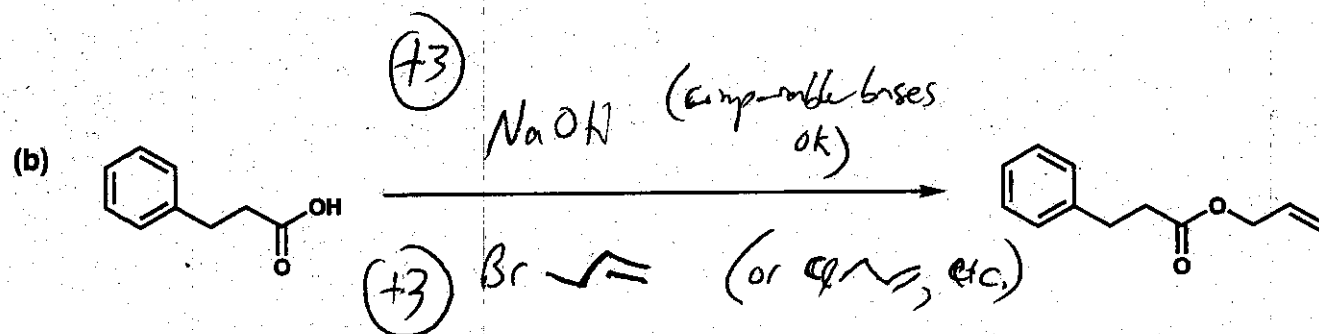
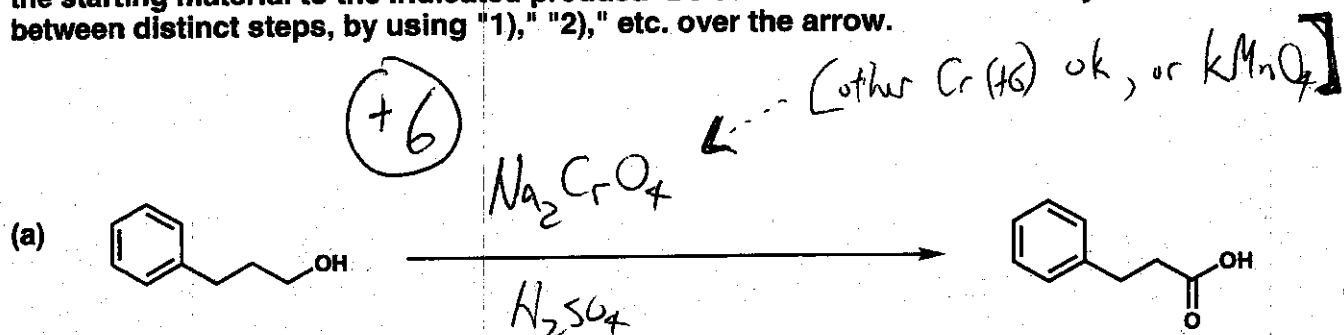
1. (18 points) Show the major product or products expected from each reaction.



(-2 For dropping a carbon)

Name _____

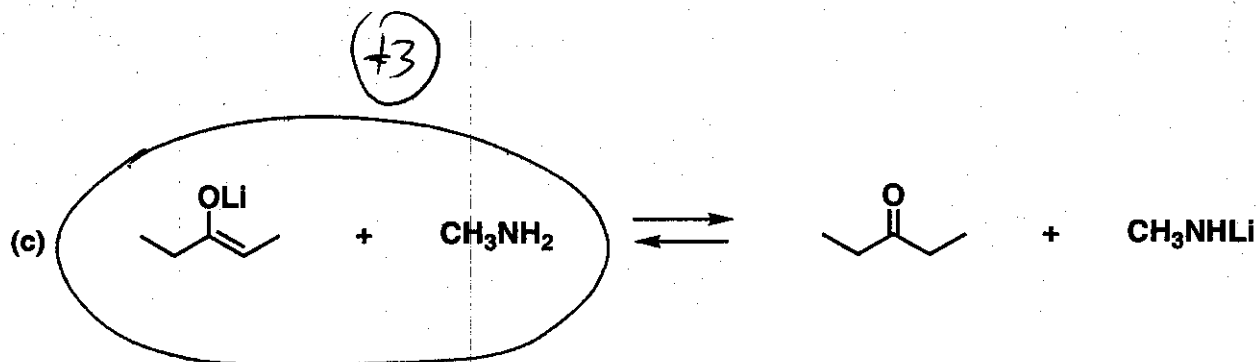
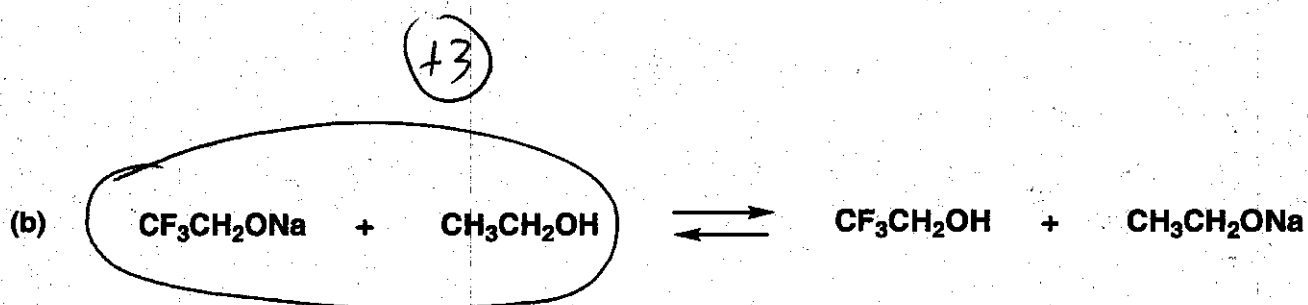
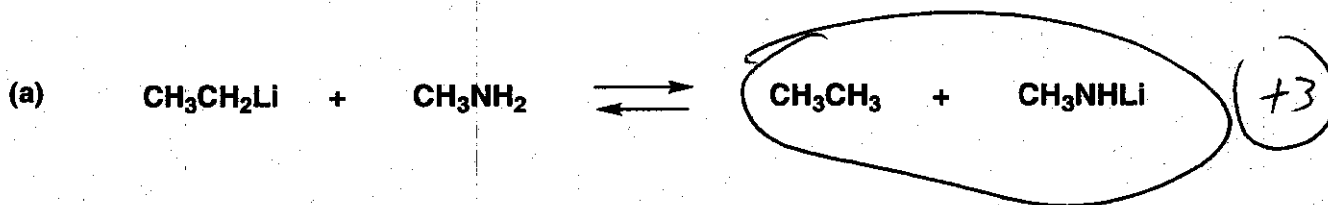
2. (18 points) Show the reagents and other organic molecules required to convert the starting material to the indicated product. Be sure to differentiate clearly between distinct steps, by using "1)," "2)," etc. over the arrow.



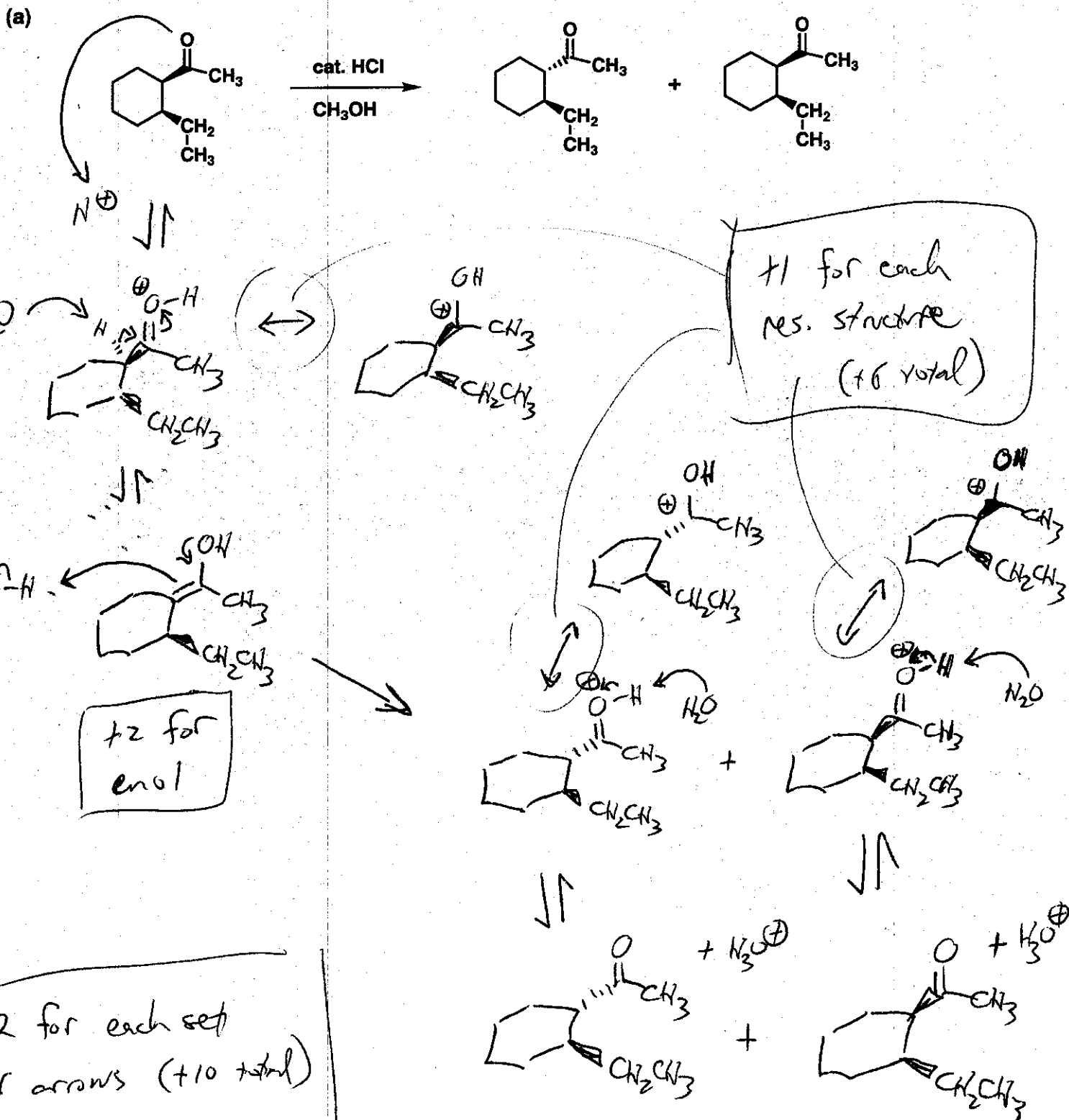
③ for just $\text{H}-\text{C}=\text{O}=\text{N}$ 5 for not sep.
 2 for $\text{O}-\text{H}$ $\text{H}-\text{O}-\text{CH}_3$

Name _____

3. (9 points) For each of the equilibria shown below, CIRCLE the side that you expect to be favored.

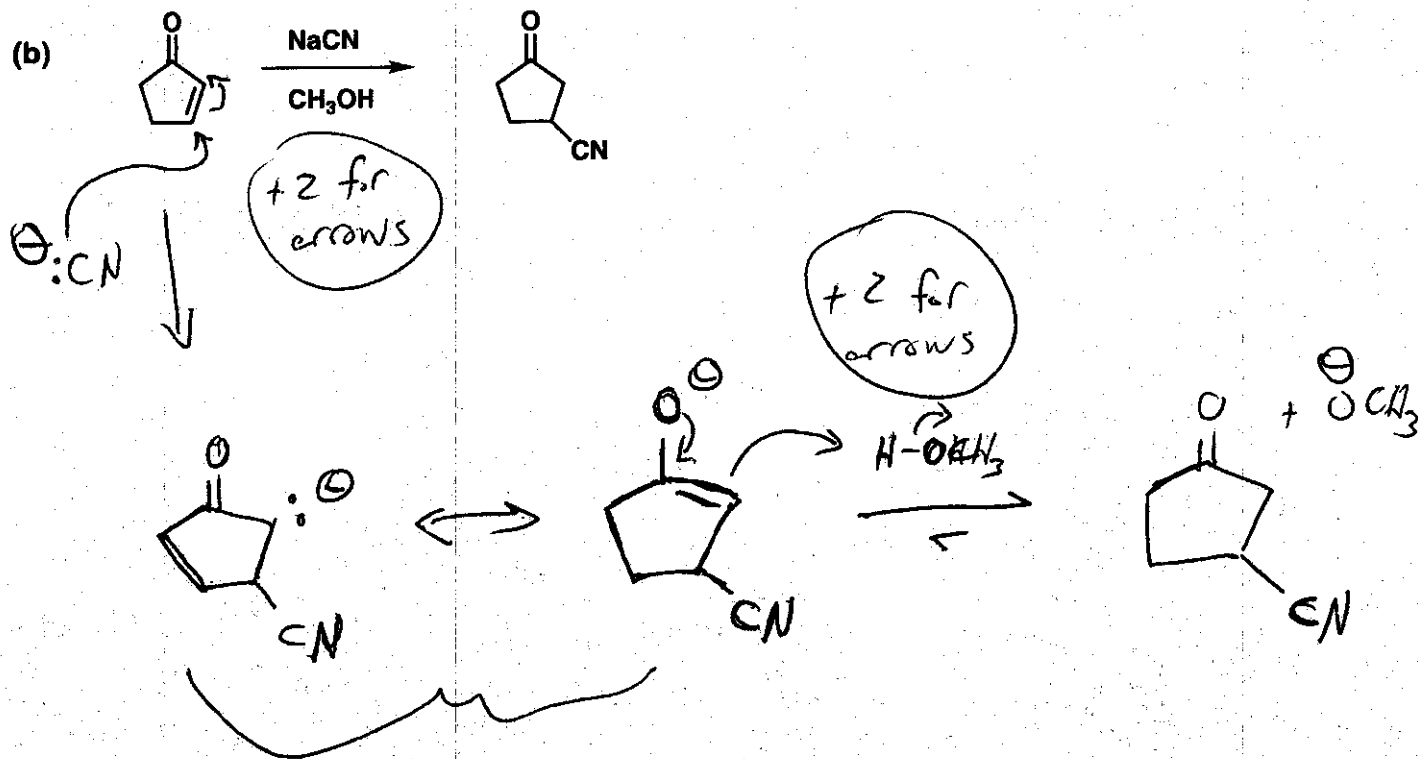


4. (25 points) Draw a complete mechanism (curved arrows) for each of the reactions shown below; be sure to show all important resonance forms.



-- cont. on next page --

4. (cont.)



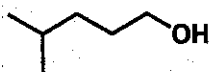
+2 for 1st res. structure

+1 for 2nd " "

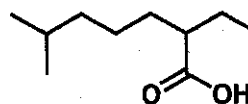
+7 for page

Name _____

5. (30 points) Below you are asked to develop two synthetic routes beginning with the "starting material" to generate the "target". In each case, there are additional constraints on your choice of starting materials.

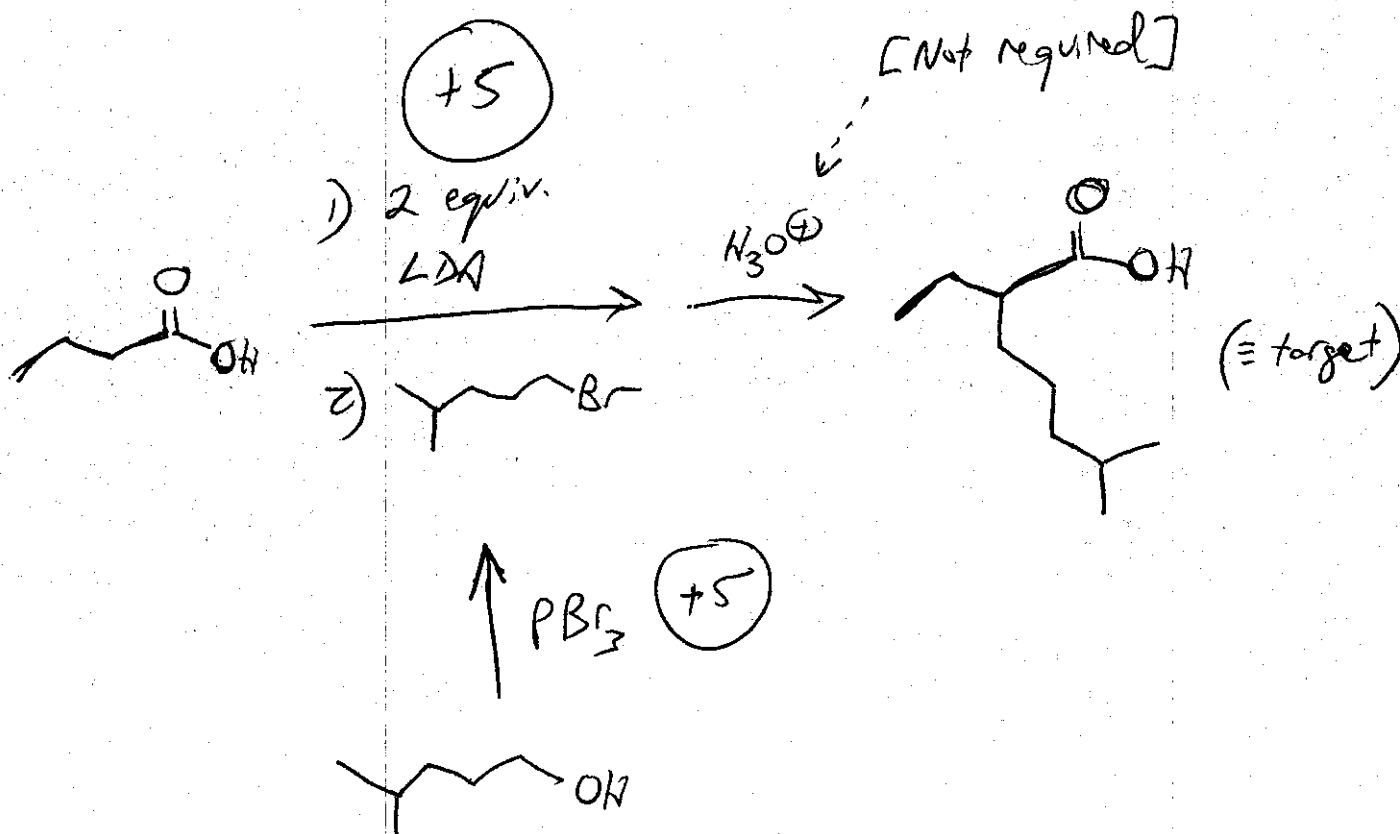


Starting Material



Target

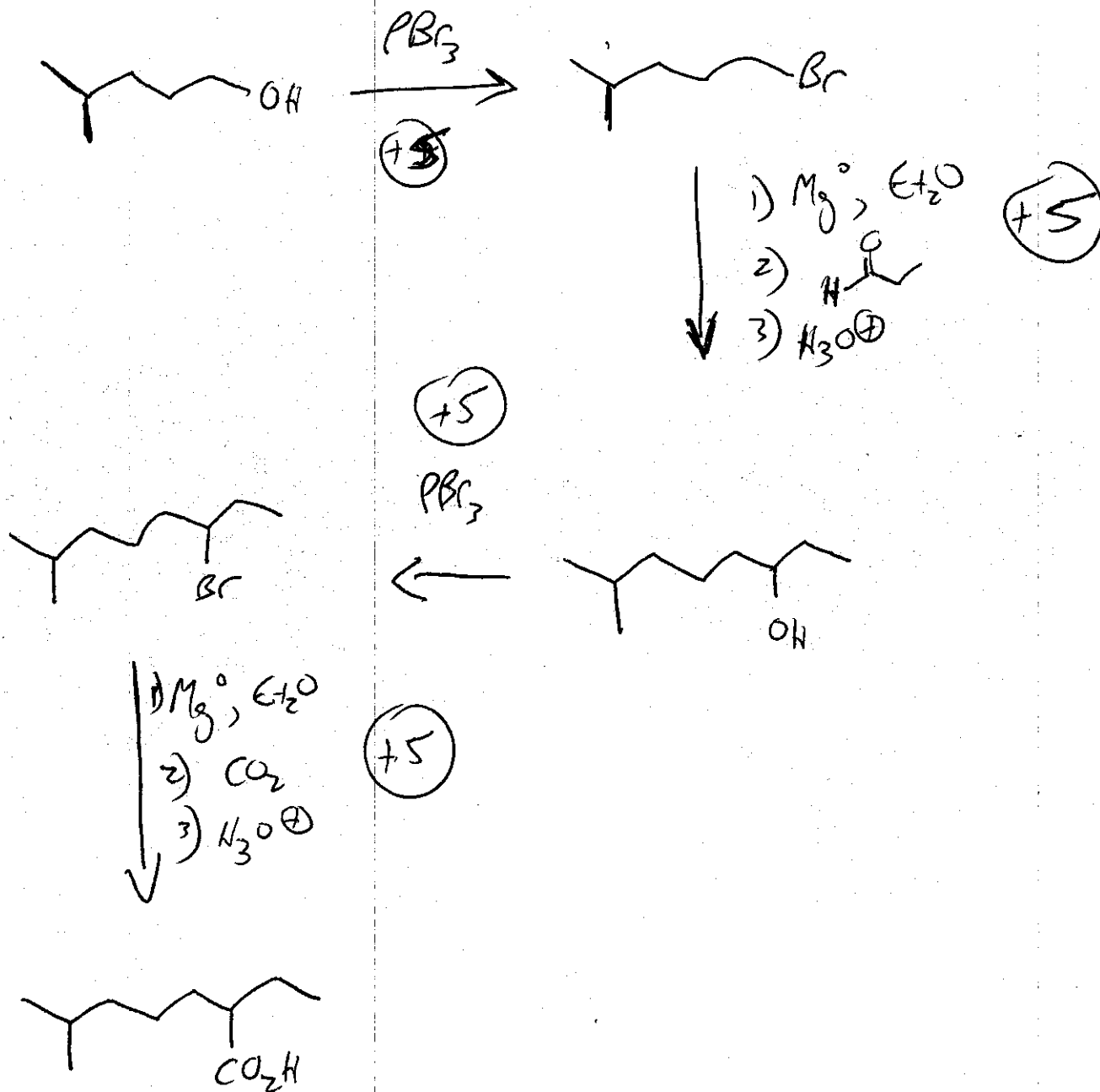
(a) Propose a synthesis of the target from the starting material that uses additional organic molecules containing no more than FOUR carbons (and any other reagents necessary).



Name _____

5. (cont.)

(b) Propose a synthesis of the target from the starting material that uses additional organic molecules containing no more than THREE carbons (and any other reagents necessary).



5. (cont.)

(b) Propose a synthesis of the target from the starting material that uses additional organic molecules containing no more than THREE carbons (and any other reagents necessary).

