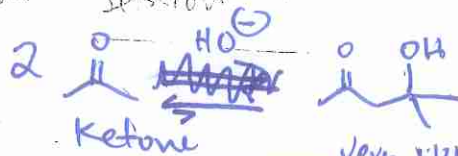
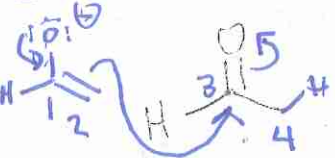


① Practice Problem Session

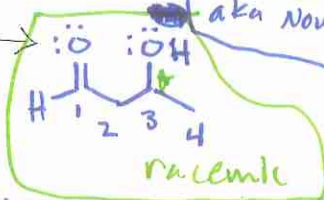
Tuesday 3/28/17

Enolate:

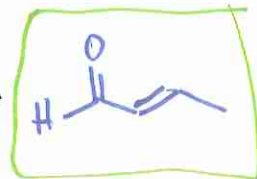


Very little forms  $\Rightarrow$  "Unfavorable thermodynamically"

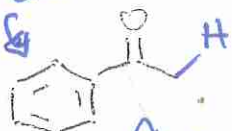
1) cat  $HO^-$



2)  $H_3O^+$  mild heat

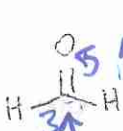


"Can't do Aldol with itself"

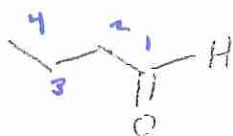
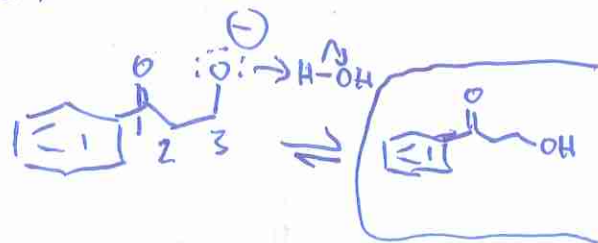


can be deprotonated by  $HO^-$  (Base)

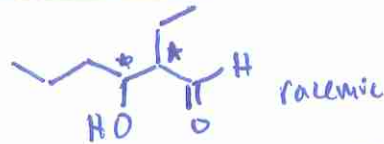
can't enolize b/c no  $\alpha$ -H atoms



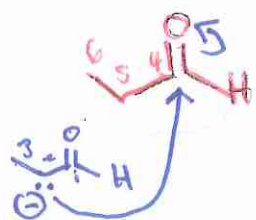
cat. NaOH



cat. NaOH

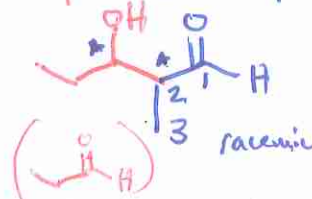


Electrophile Nucleophile (turn down group at  $\alpha$ -Carbon)

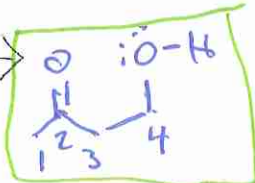


Nucleophile still has  $C=O$   
 Electrophile has  $C-OH$

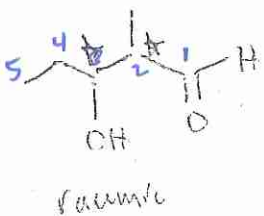
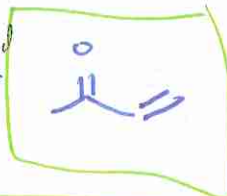
cat. NaOH



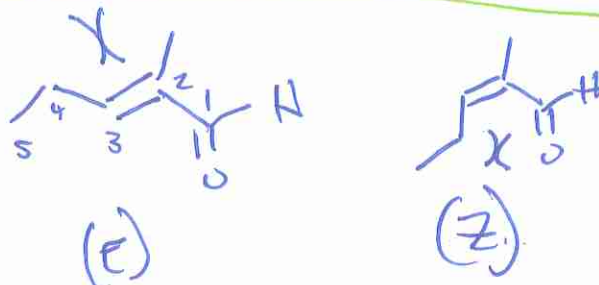
1) cat. NaOH



2)  $HCl/H_2O$  mild heat



$H_3O^+$  heat

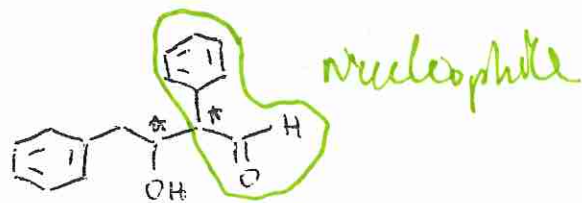
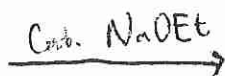


$E, Z$  mixture

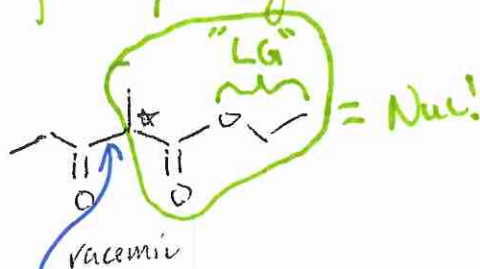
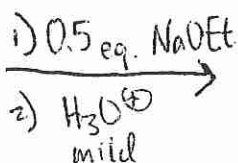
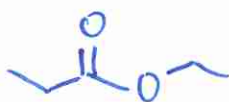
2



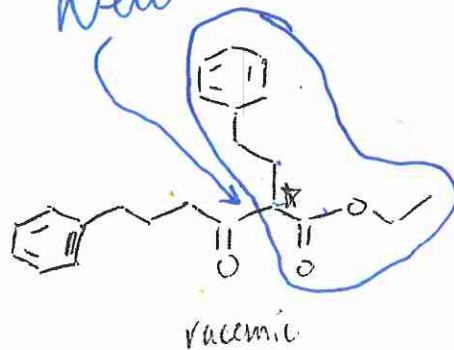
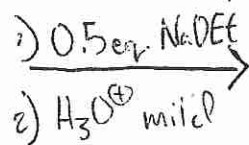
Decarboxylation



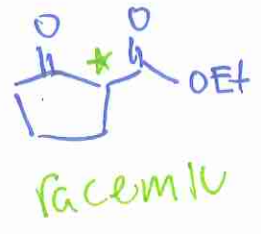
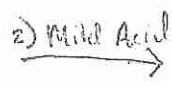
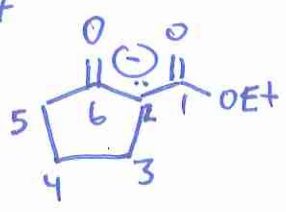
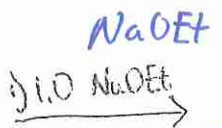
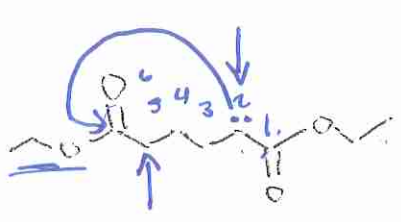
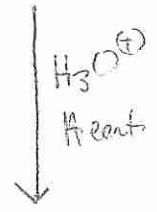
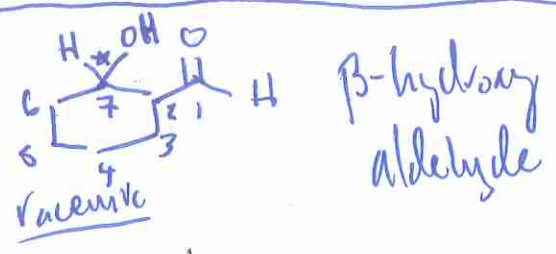
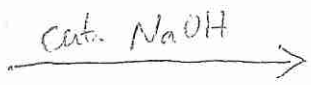
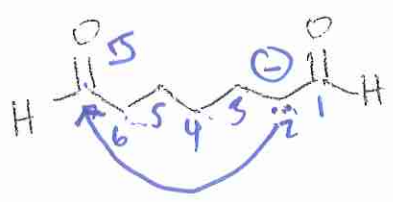
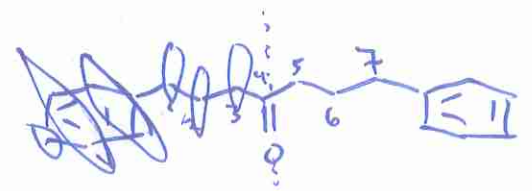
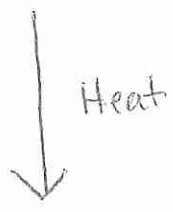
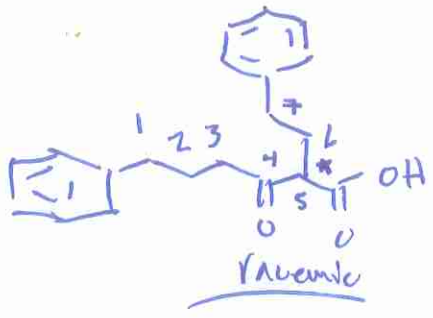
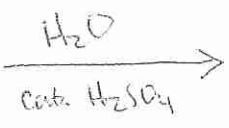
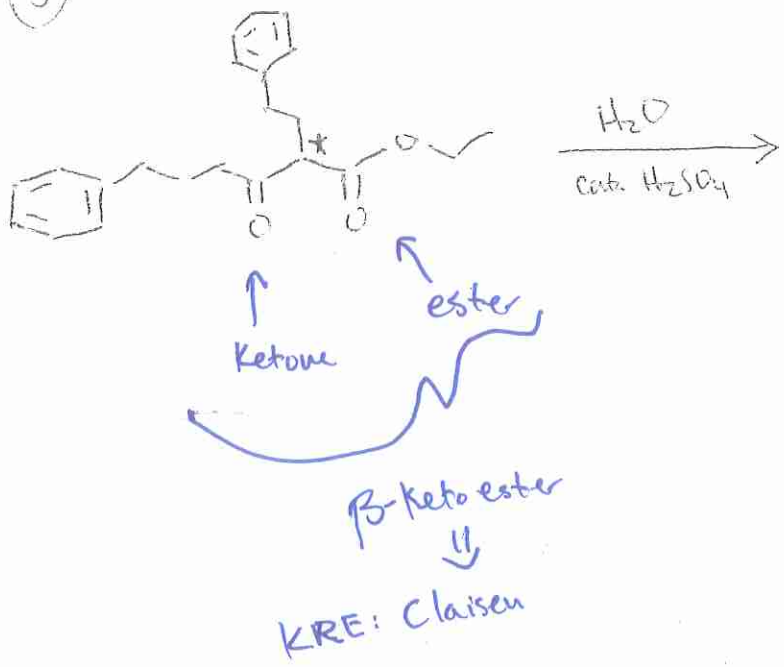
racemic  $\beta$ -Hydroxy Aldehyde



New C-C bond



(3)

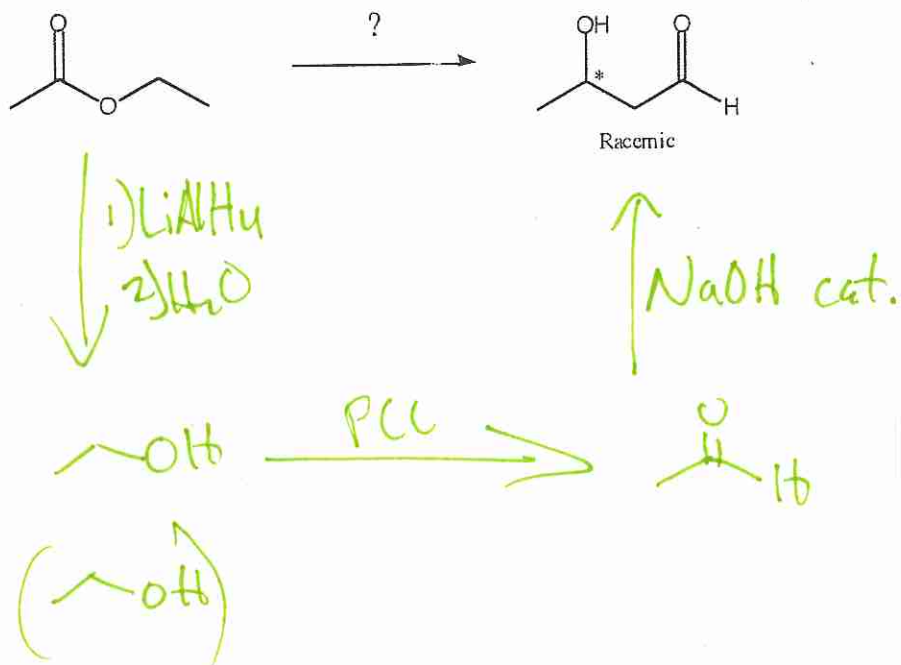


Signature \_\_\_\_\_

Pg 12 \_\_\_\_\_ (7)

21. For the following synthesis questions, show how the starting material can be converted into the product. Show ALL intermediate molecules synthesized along the way, and show the reagents needed for each step. To get full credit, you must use the predominant product expected for each step. All of the carbon atoms of the product must come from the starting material(s).

(7 pts)

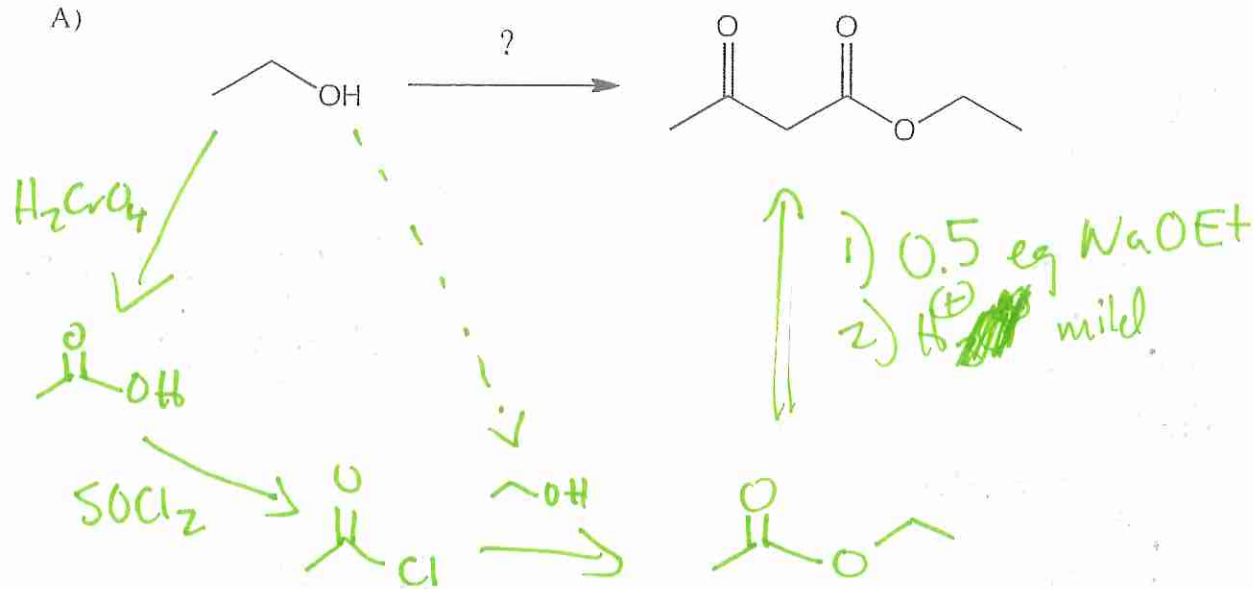


17. (10 pts) Using any reagents turn the starting material into the indicated product. All carbon atoms must come from the starting material. Draw all molecules synthesized along the way. When in doubt, draw the molecule! Label all chiral centers with an asterisk (\*) and make sure to right "Racemic" where appropriate. Hint: this should look familiar as a homework problem.

Remember, all of the carbons of the product must come from the given starting material.

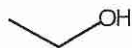
(10 pts)

A)

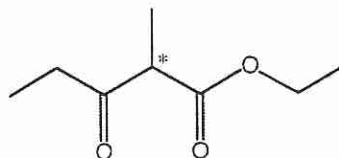


21. For the following synthesis questions, show how the starting material can be converted into the product. Show ALL intermediate molecules synthesized along the way and show the reagents needed for each step. To get full credit, you must use the predominant product expected for each step. All of the carbon atoms of the product must come from the starting material(s).

(16 pts)

 $\text{CO}_2$ 

?



Racemic

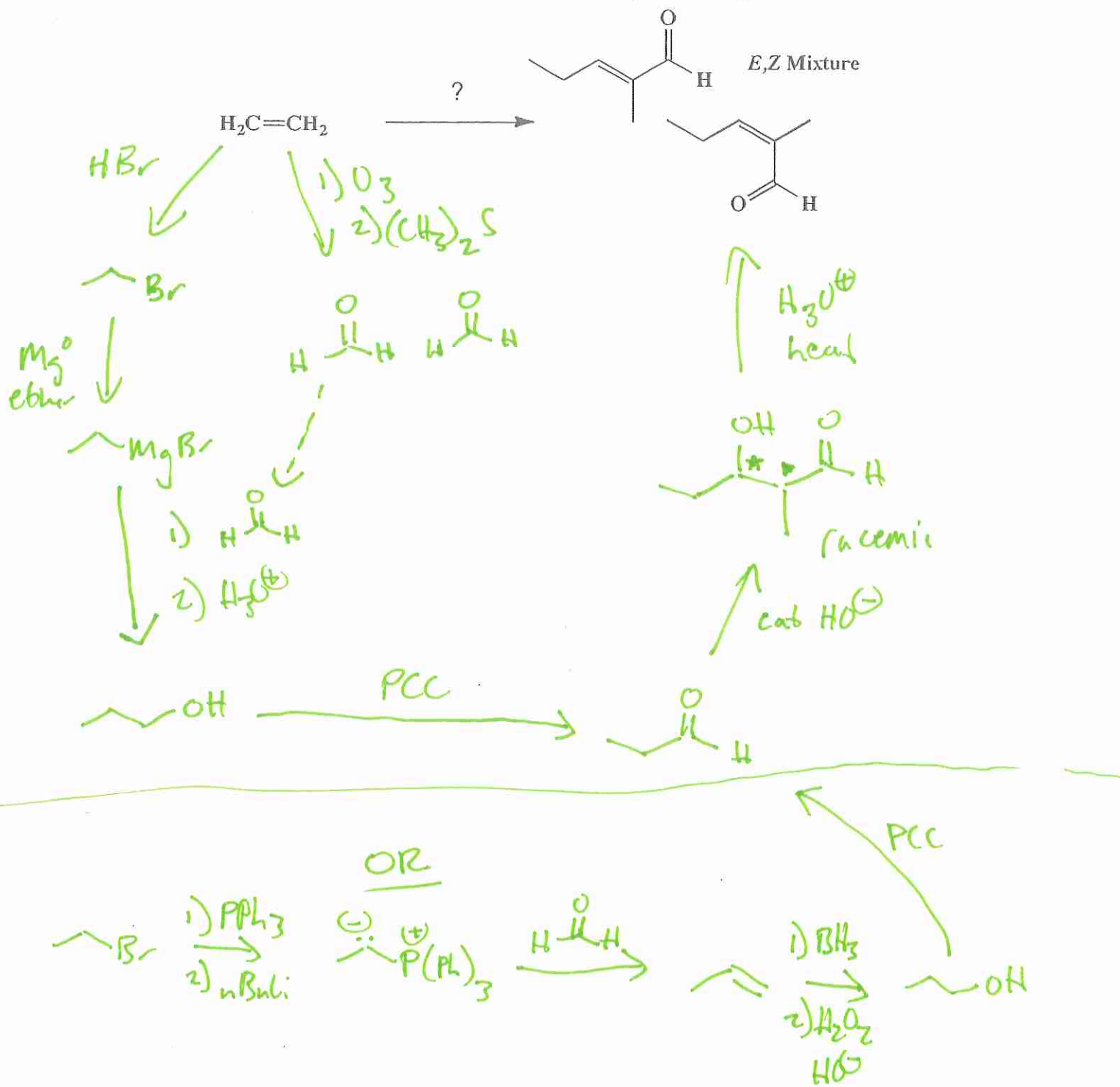
 $\text{PBr}_3$  $\text{Mg}^0$   
Ether1)  $\text{CO}_2$ 2)  $\text{H}_3\text{O}^+$   
mild $\text{SOCl}_2$ 

OR

1) 0.5 eq  $\text{NaOEt}$   
2)  $\text{H}^+$  mild

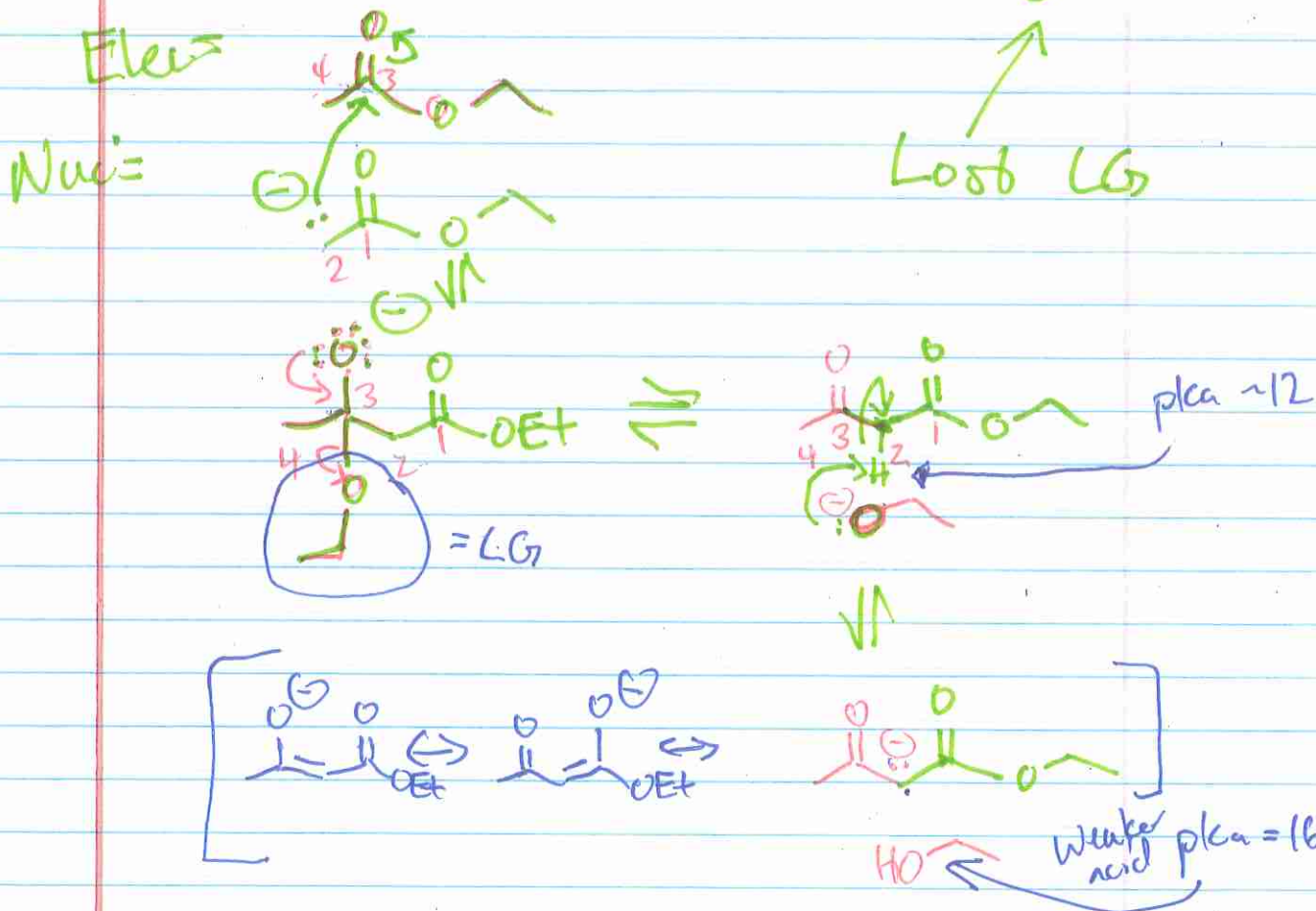
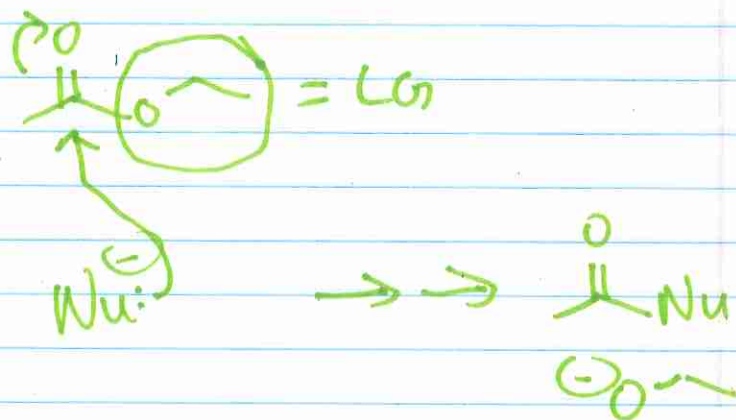
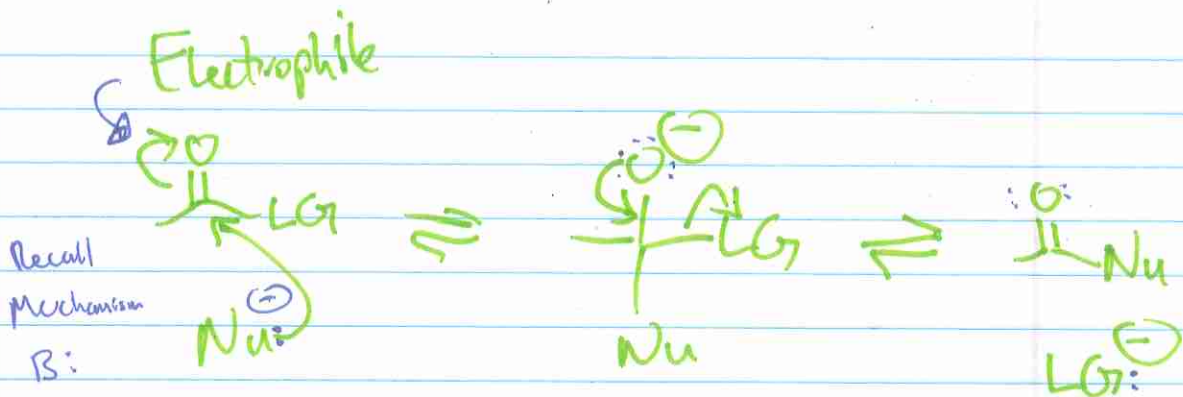
17. (cont. 19 pts) Using any reagents turn the starting material into the indicated product. All carbon atoms must come from the starting material. Draw all molecules synthesized along the way. When in doubt, draw the molecule! Label all chiral centers with an asterisk (\*) and make sure to right "Racemic" where appropriate.

Remember, all of the carbons of the product must come from the given starting material.

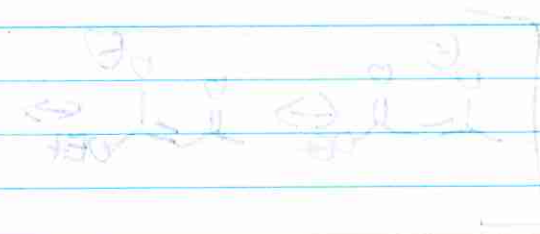
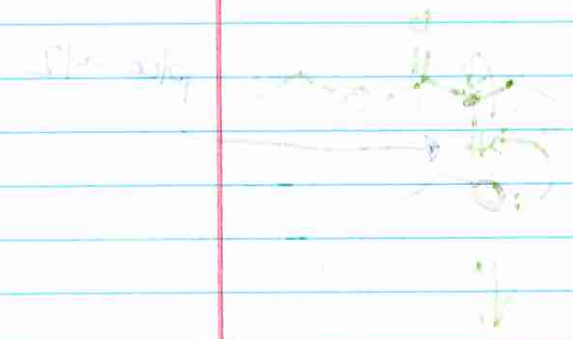








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Handwritten notes at the bottom left of the page, including the word "Handwritten" written vertically.