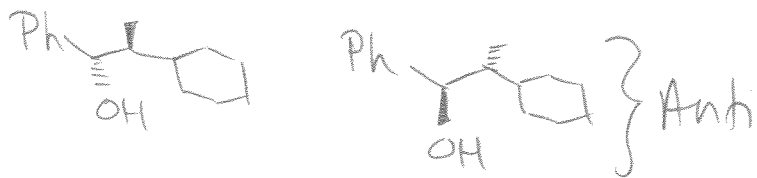
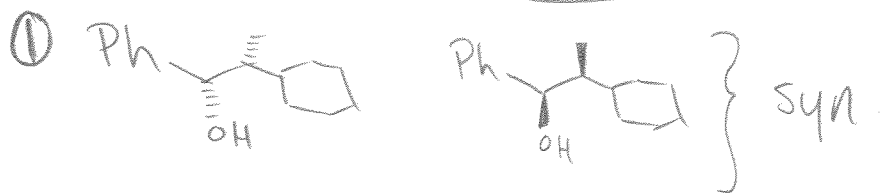
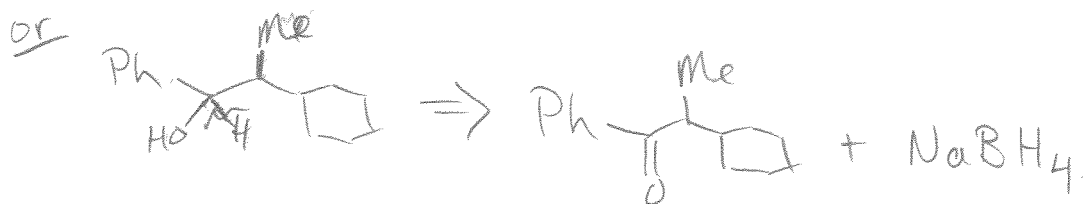
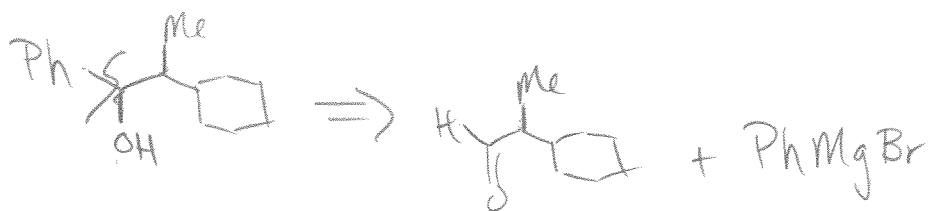


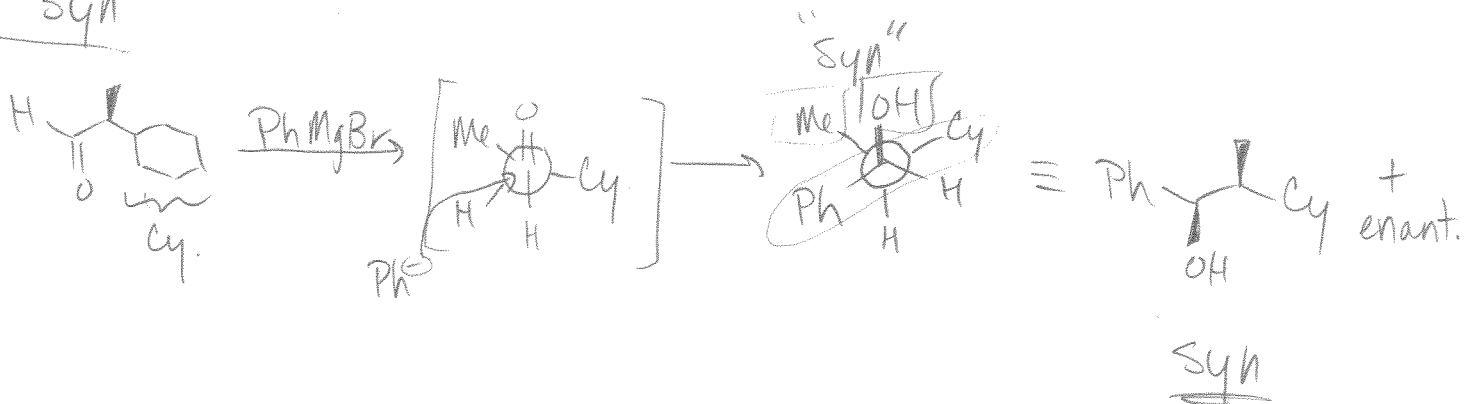
Assignment #1 Answer Key



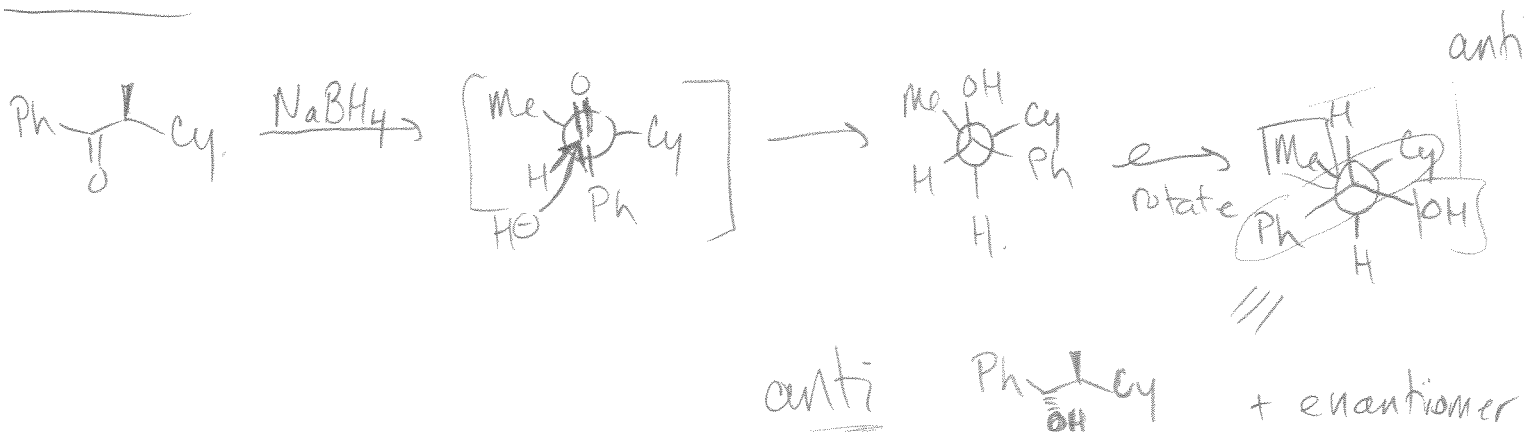
Disconnections:



For "syn"

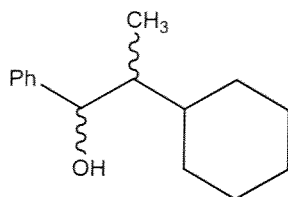


For "anti"

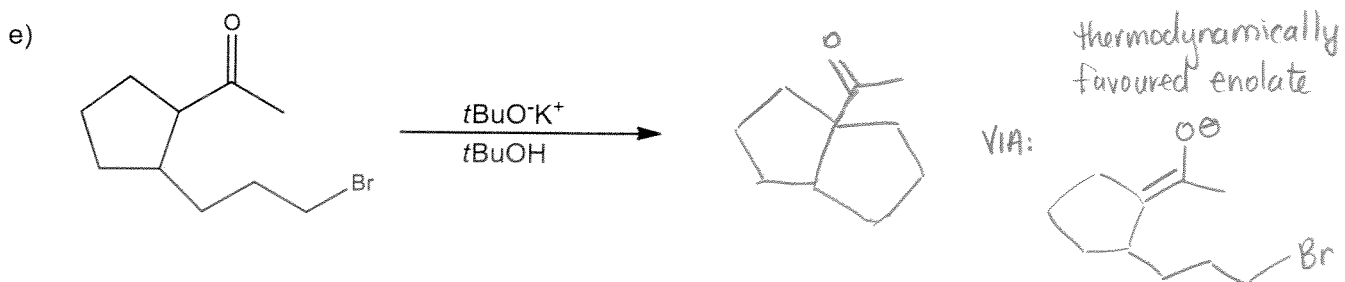
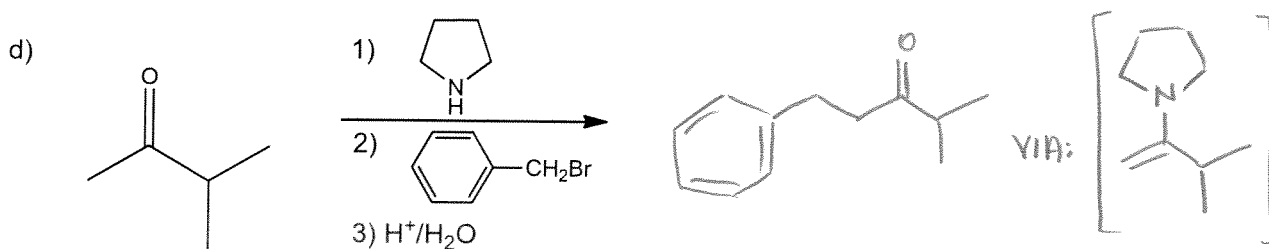
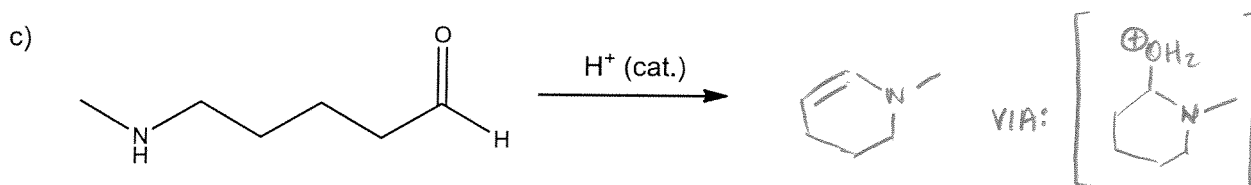
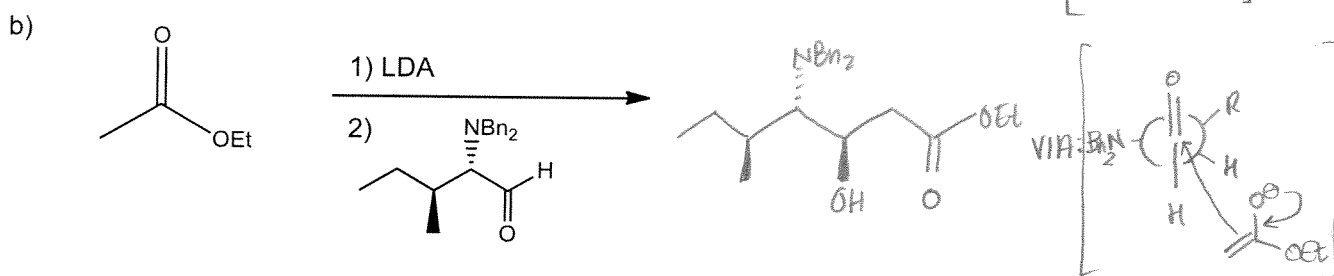
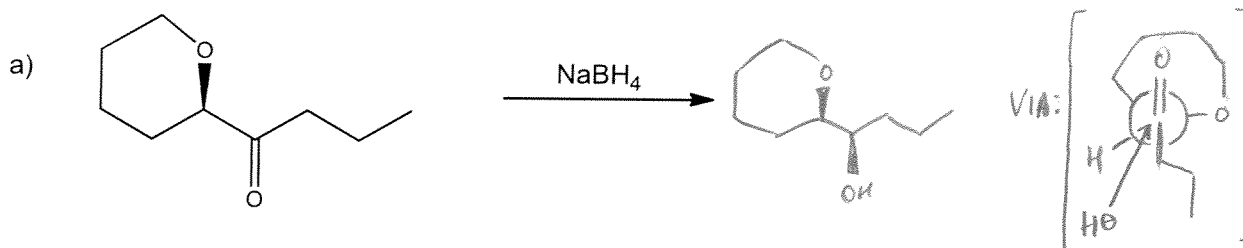


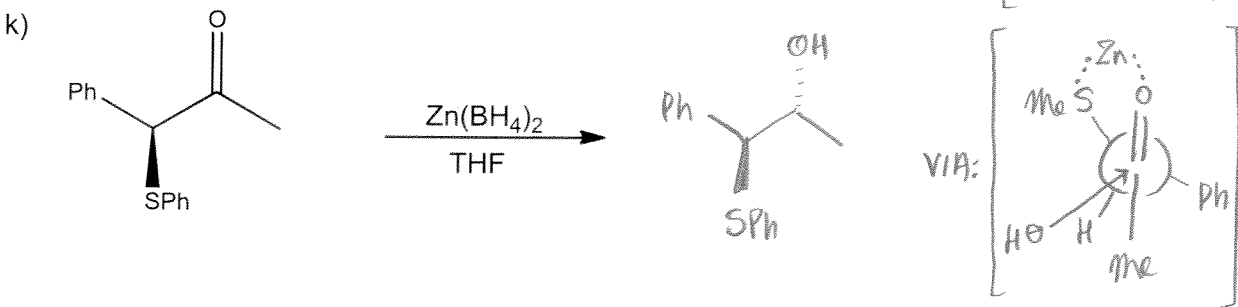
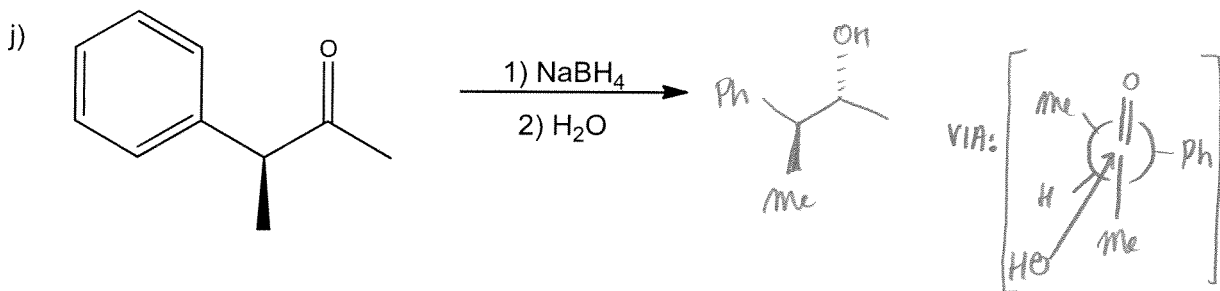
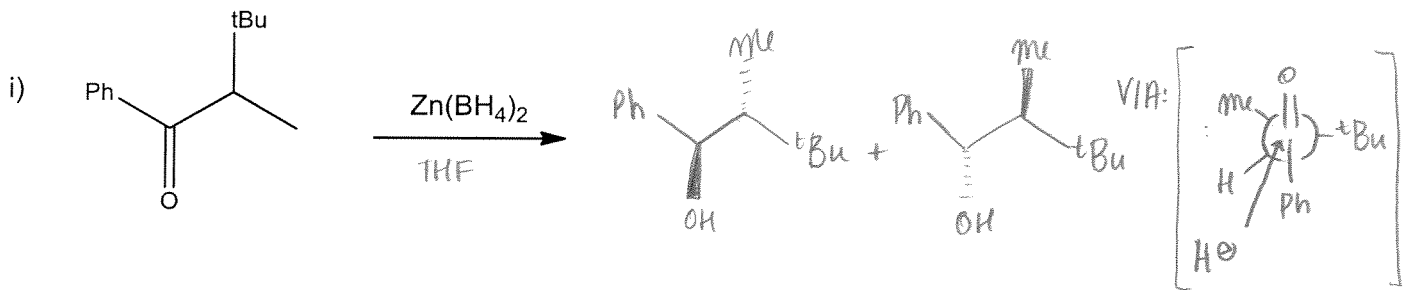
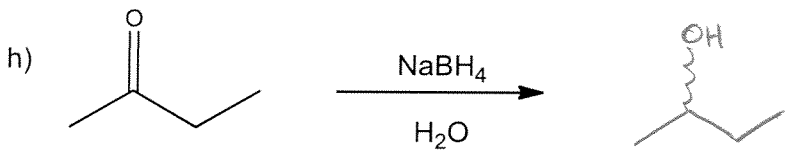
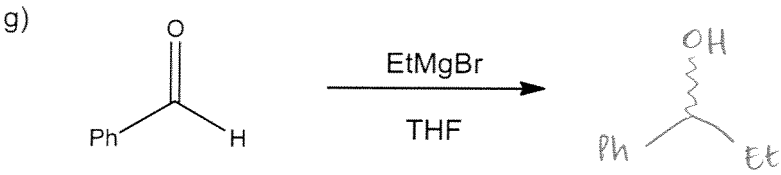
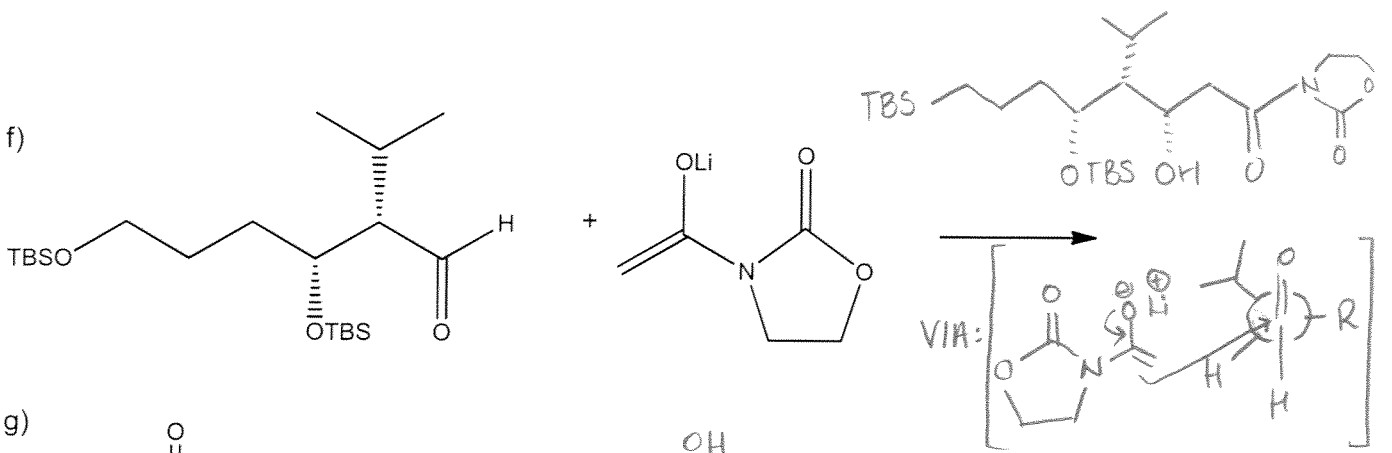
PART A

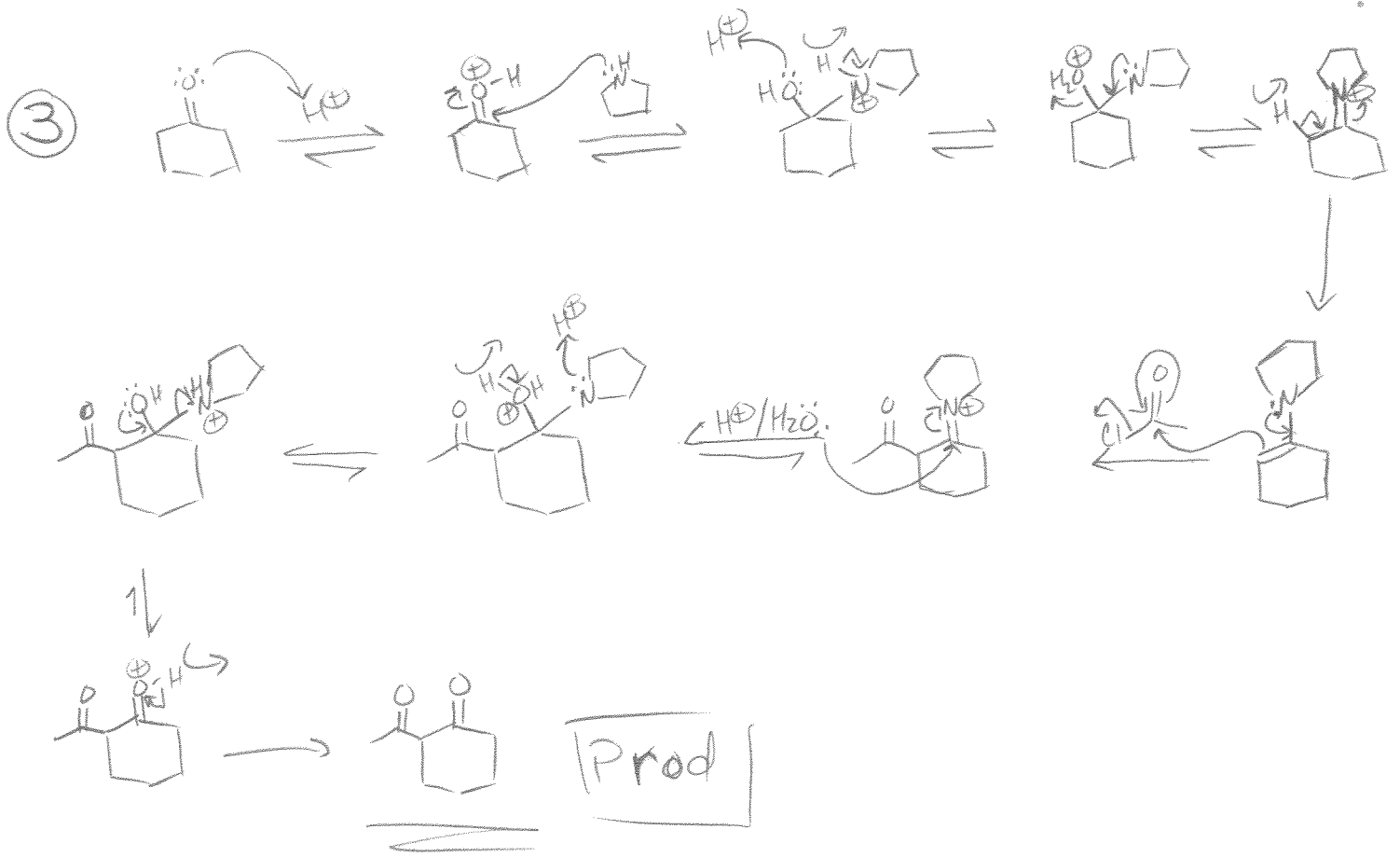
1) Synthesize the "syn" and "anti" isomers of the following molecule:



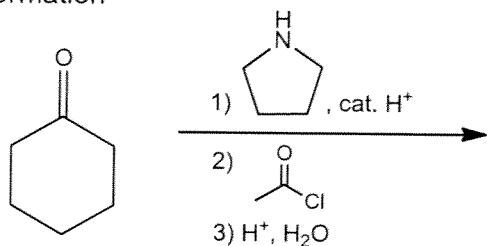
2) Predict the major product in each of the following reactions (include stereochemistry where appropriate):



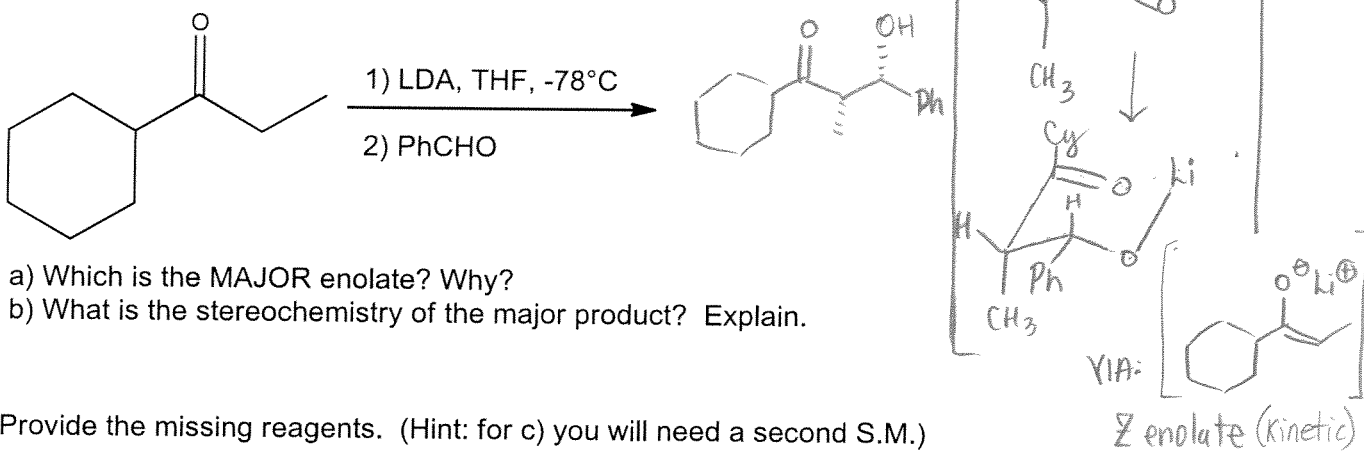




3) For the following reaction, predict the product and provide a plausible mechanism for its formation



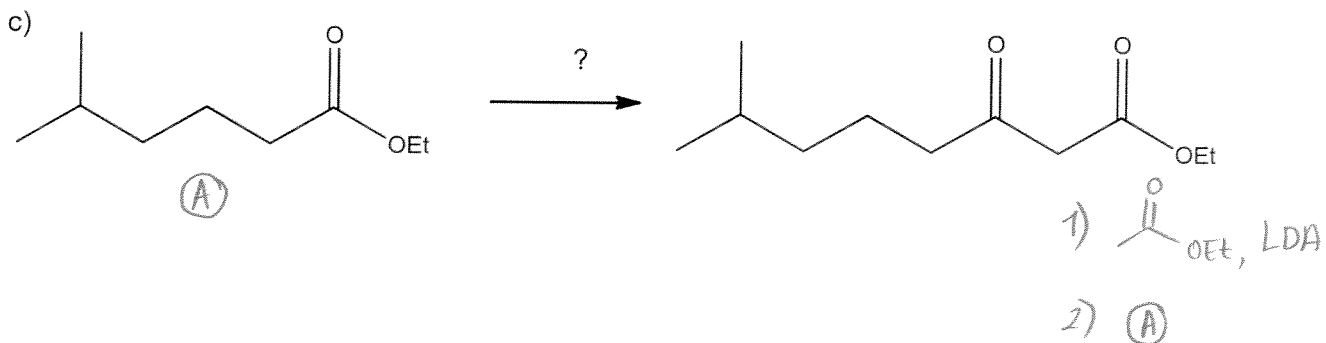
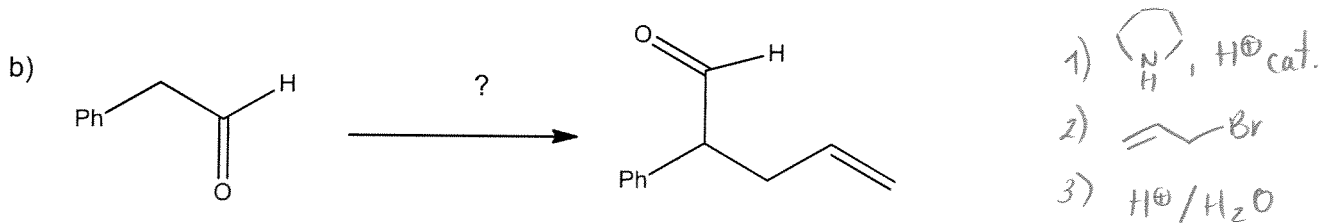
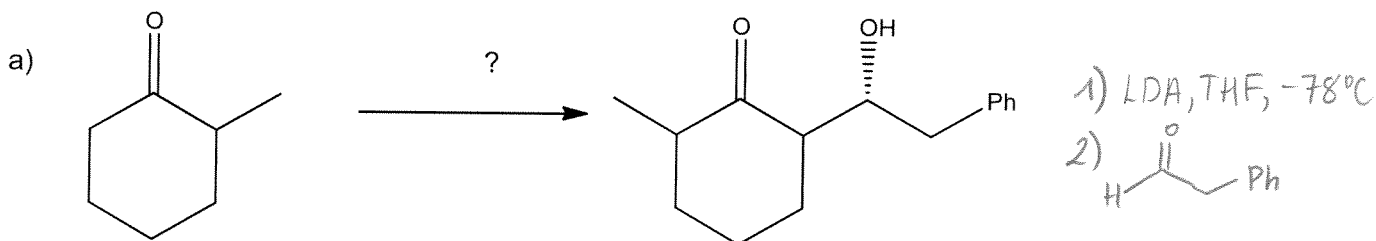
4) Consider the following reaction:



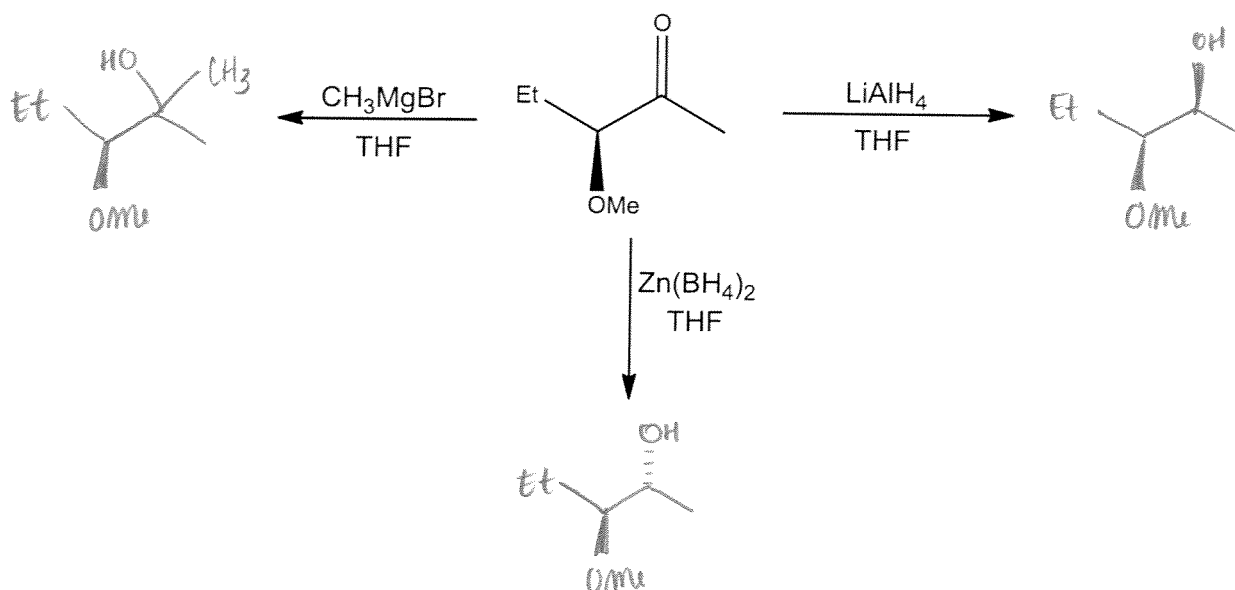
a) Which is the MAJOR enolate? Why?

b) What is the stereochemistry of the major product? Explain.

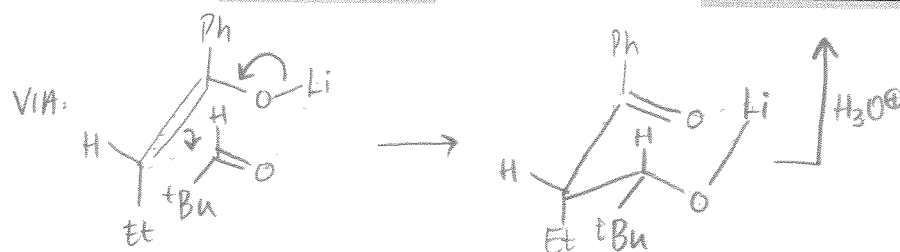
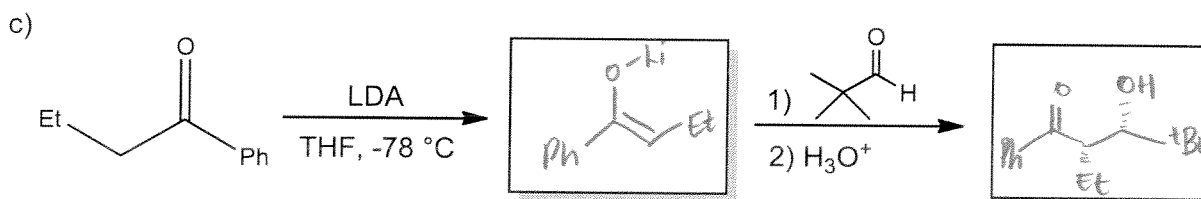
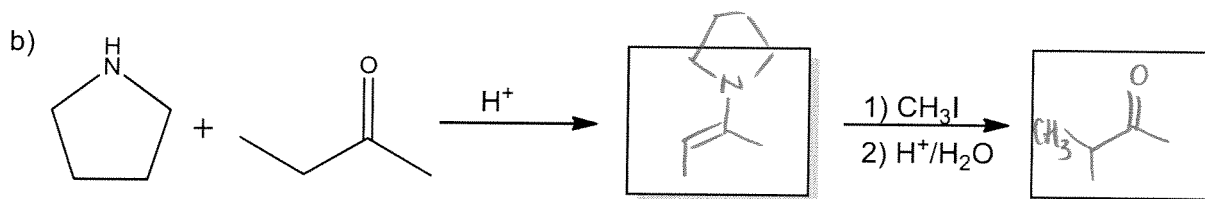
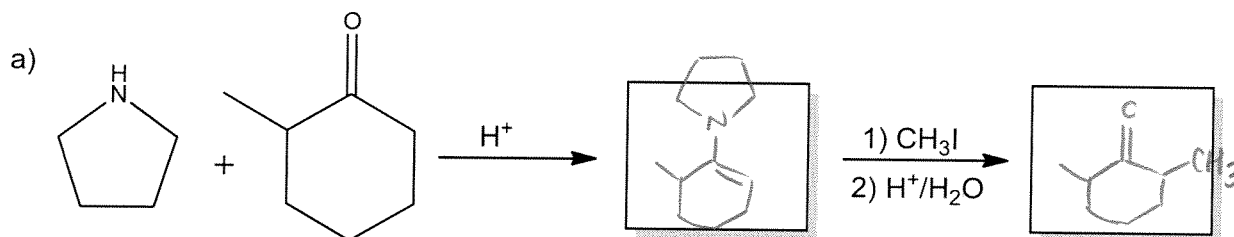
5) Provide the missing reagents. (Hint: for c) you will need a second S.M.)



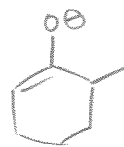
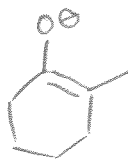
6) Provide the structure of the major product for each of the following sets of reaction conditions (include appropriate stereochemistry).



7) Predict the major product from the following reactions. For c) draw the transition state leading to the formation of this product.



8



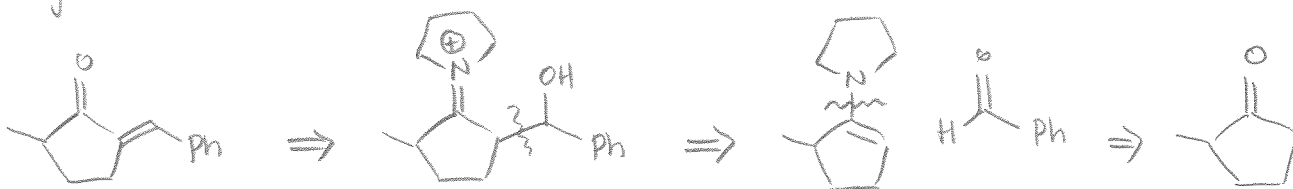
Thermodynamic Enolate:

- use base with similar pKa
- slight excess of carbonyl
- use protic solvents

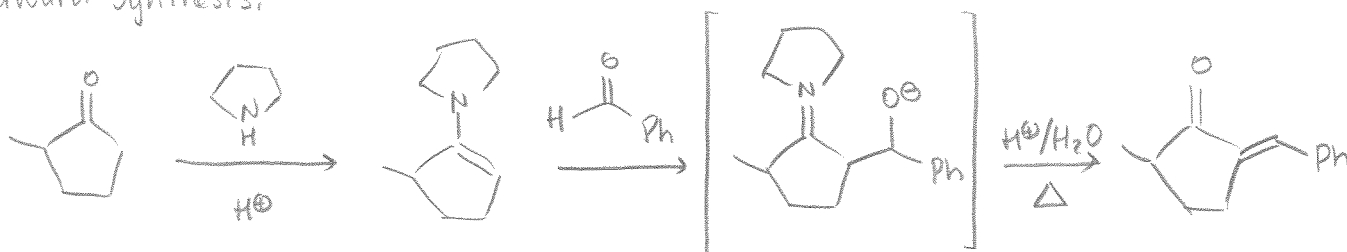
Kinetic Enolate:

- use strong hindered base (LDA)
- slight excess of base
- add ketone to a solution of base
- use aprotic solvents

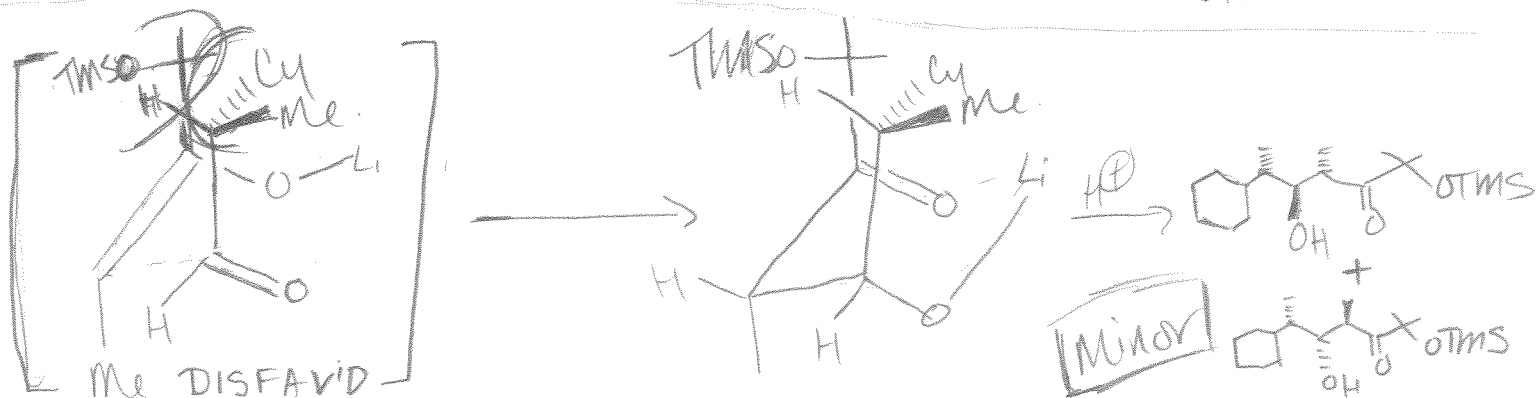
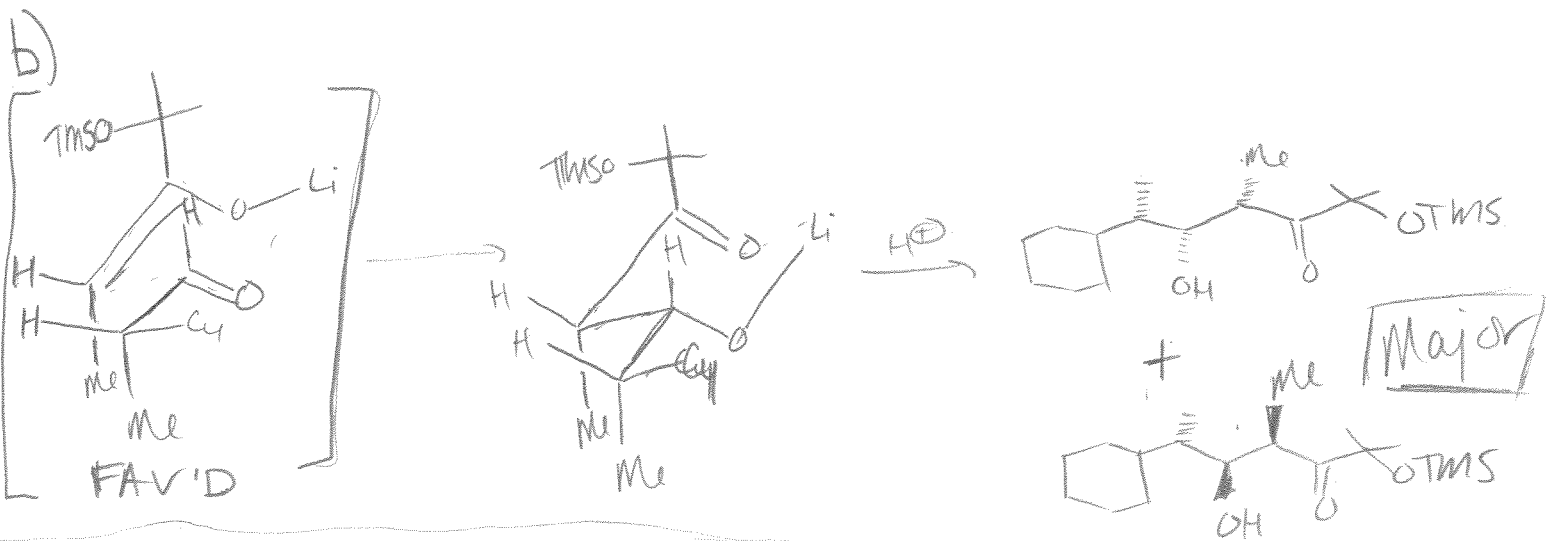
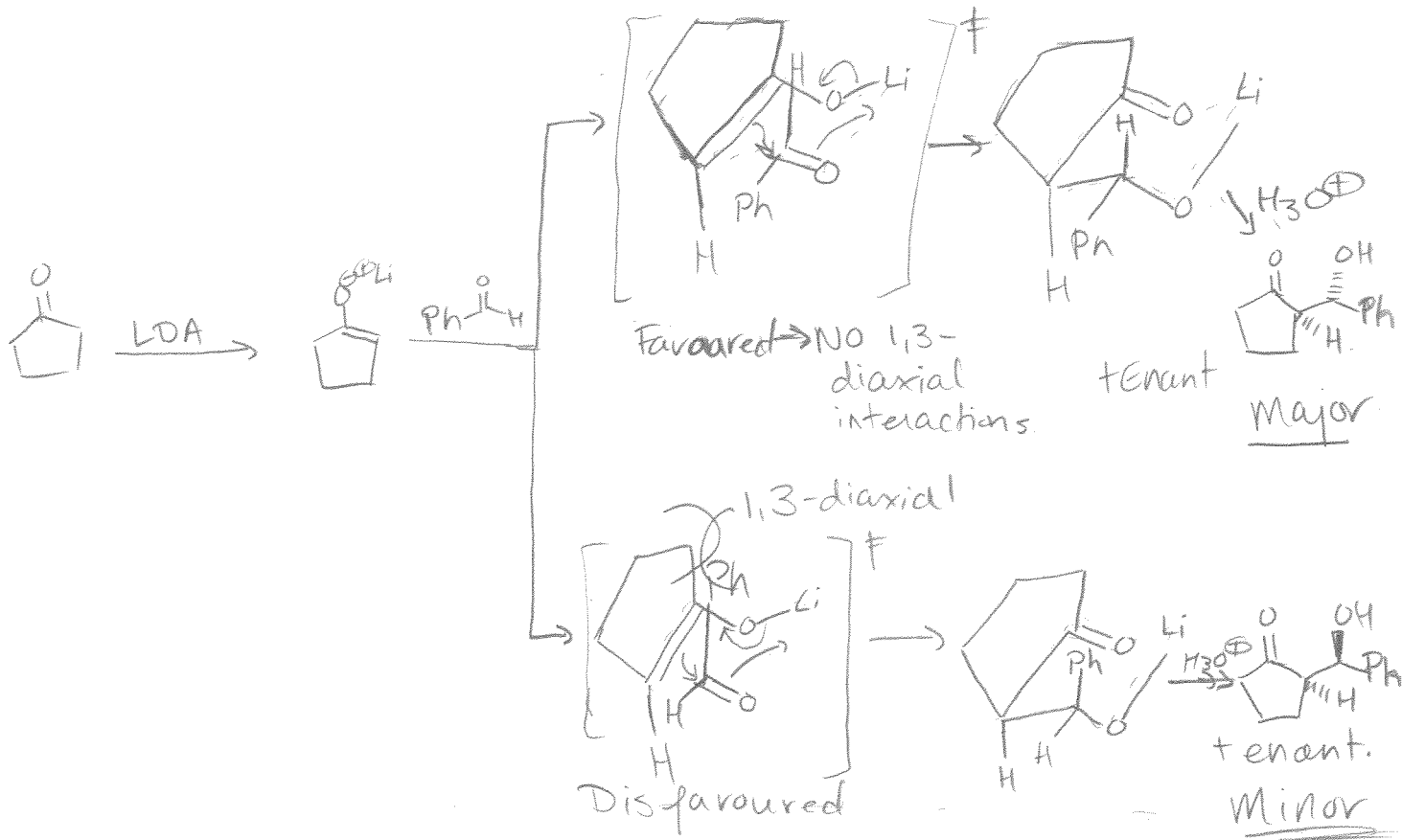
9 Retrosynthesis:



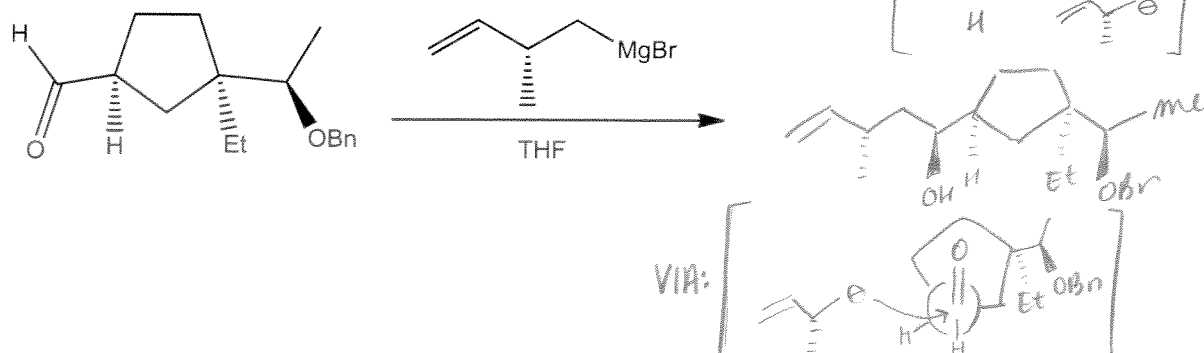
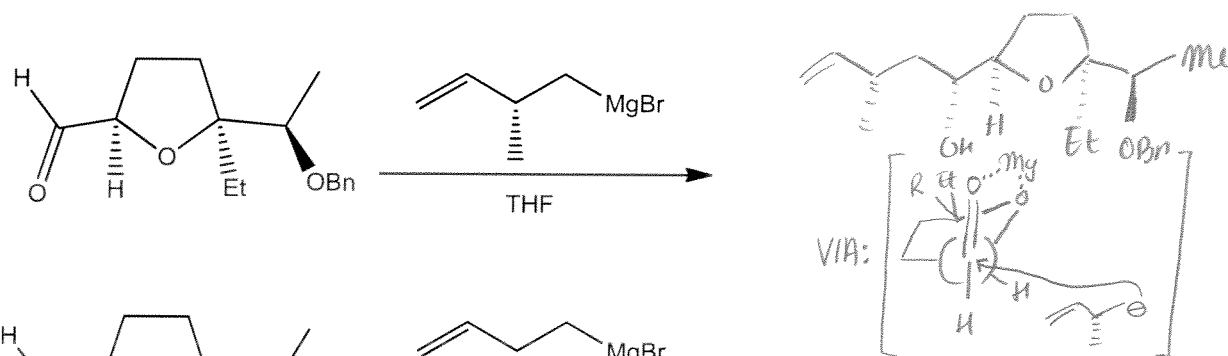
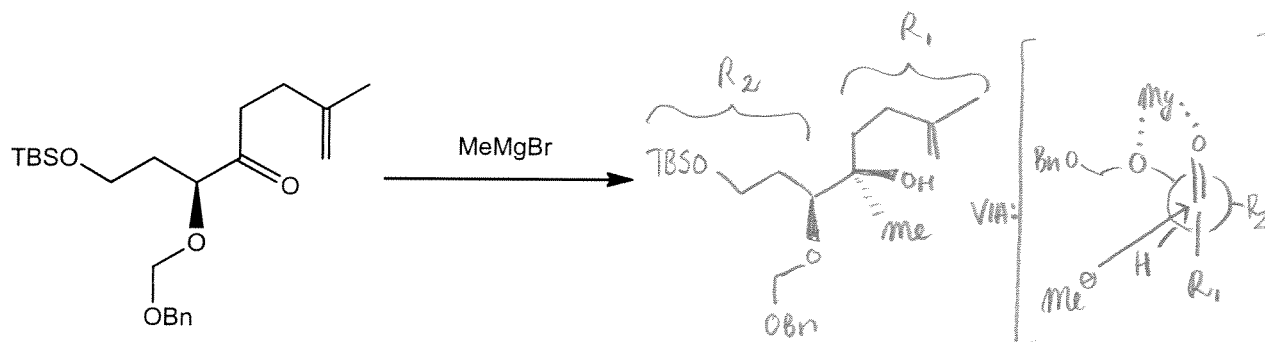
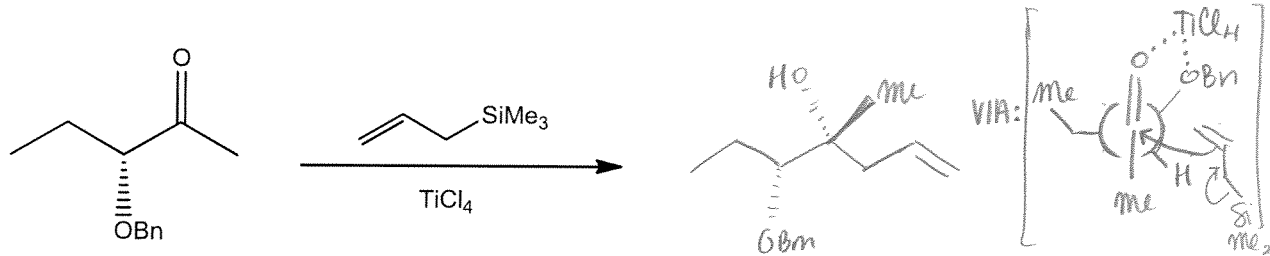
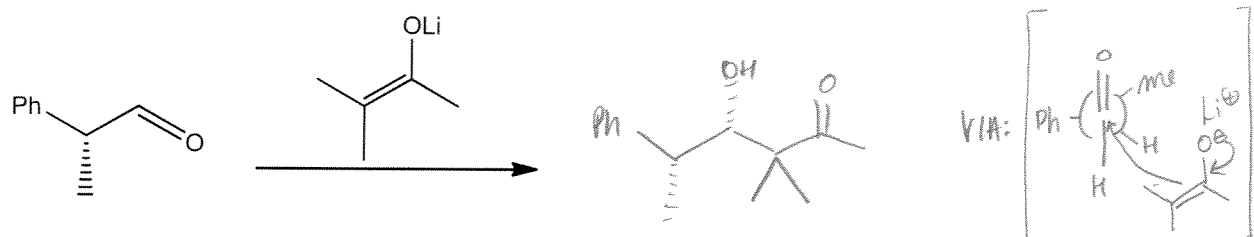
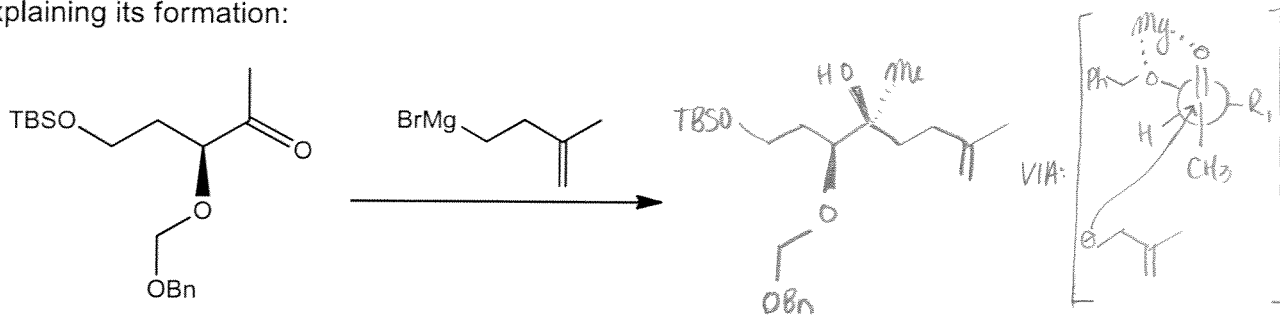
Forward Synthesis:

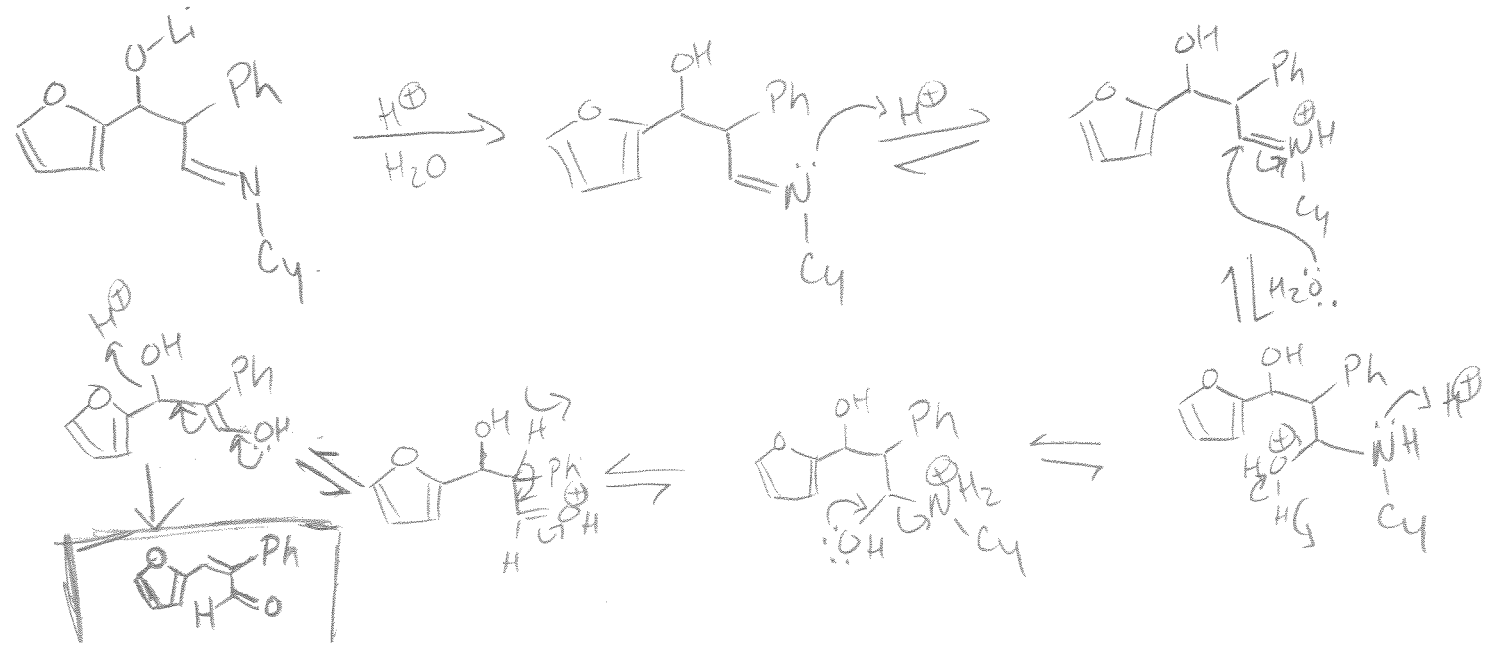
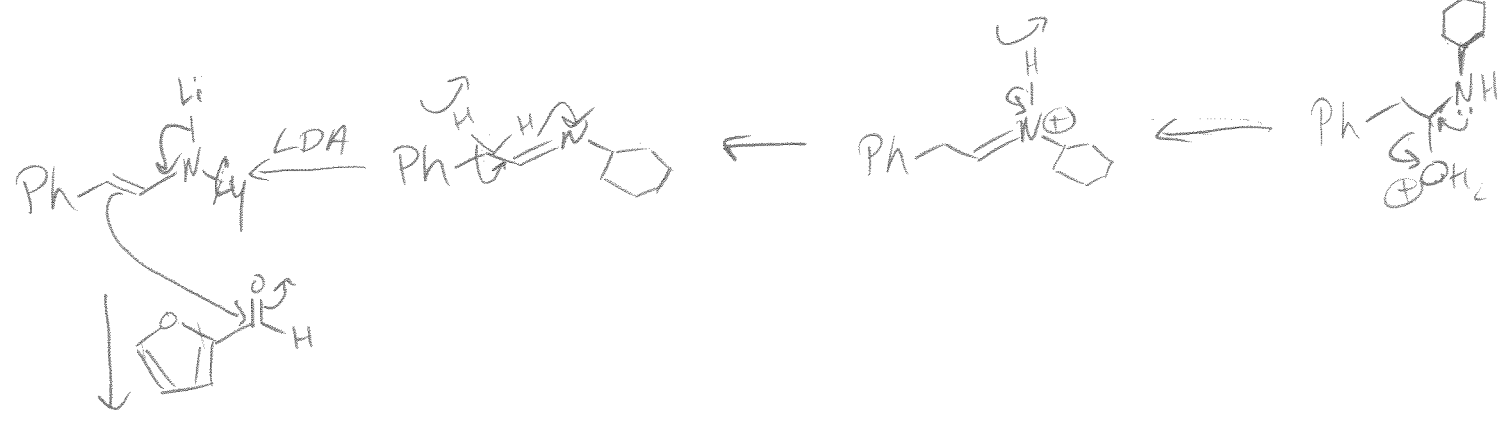
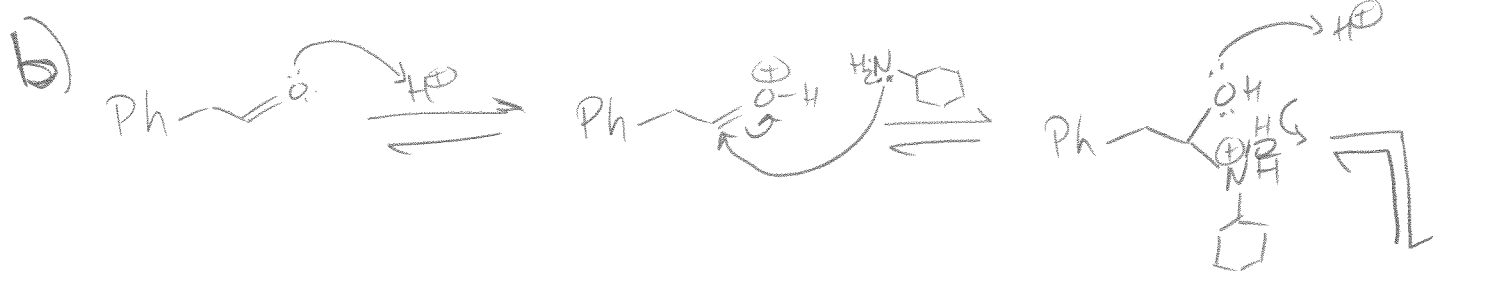
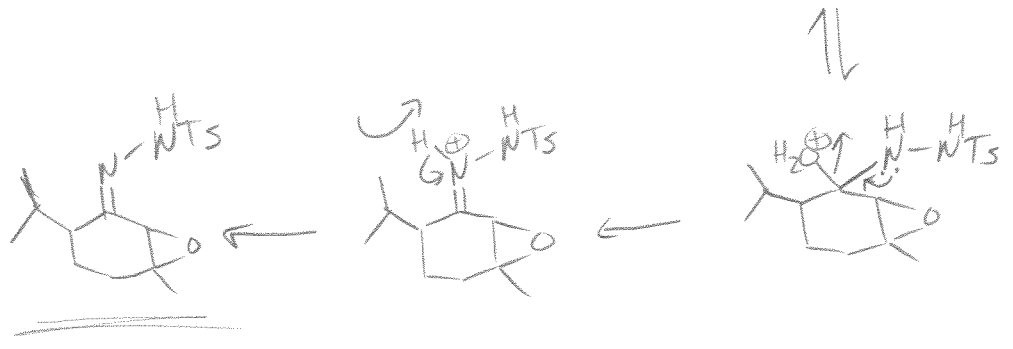
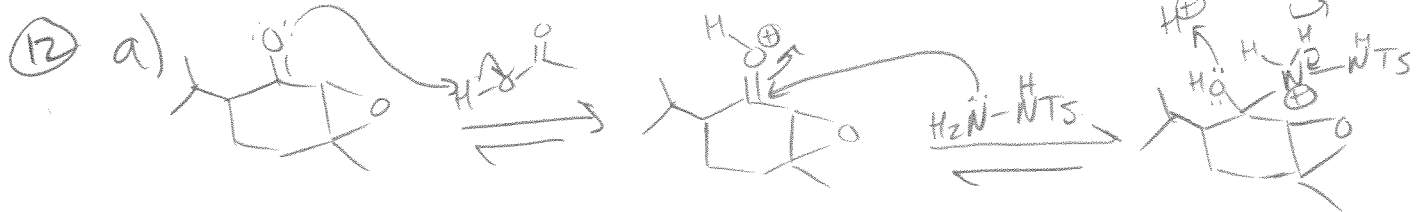


10 a)

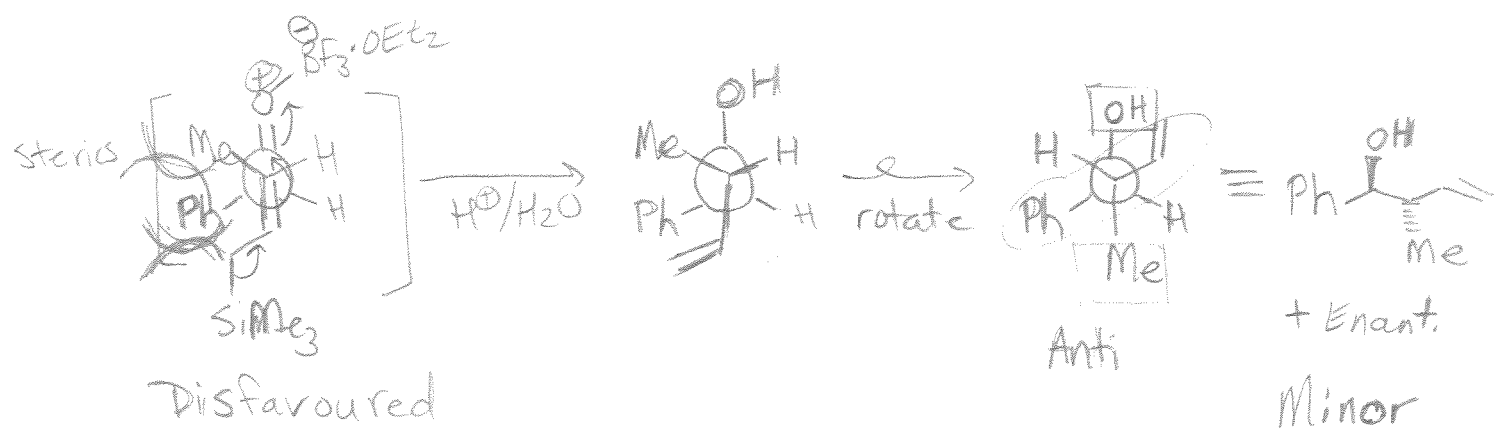
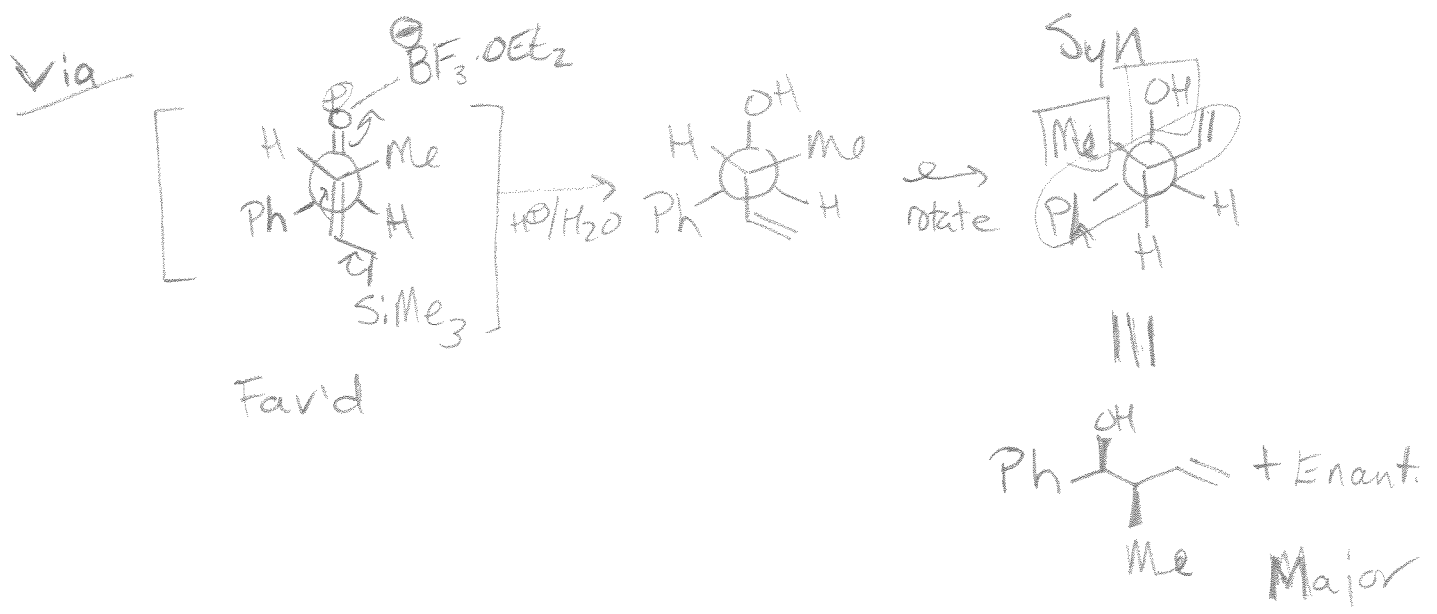
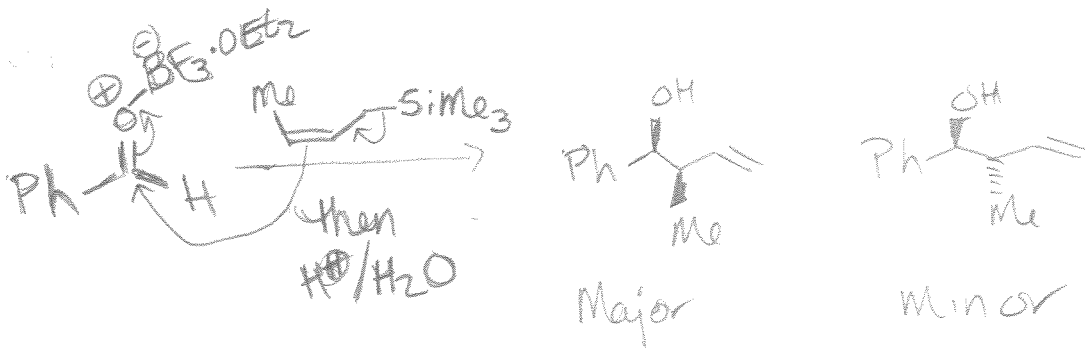


11) Predict the major product in each of the following reactions and draw the transition state explaining its formation:

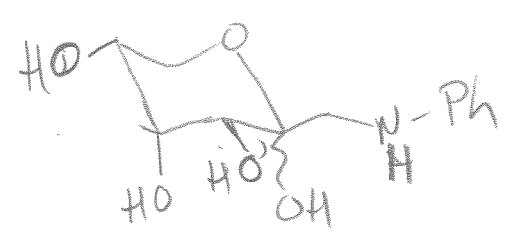
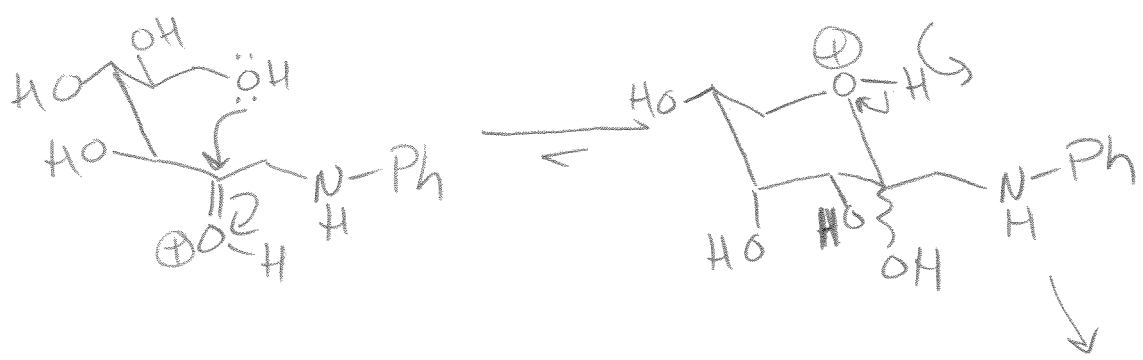
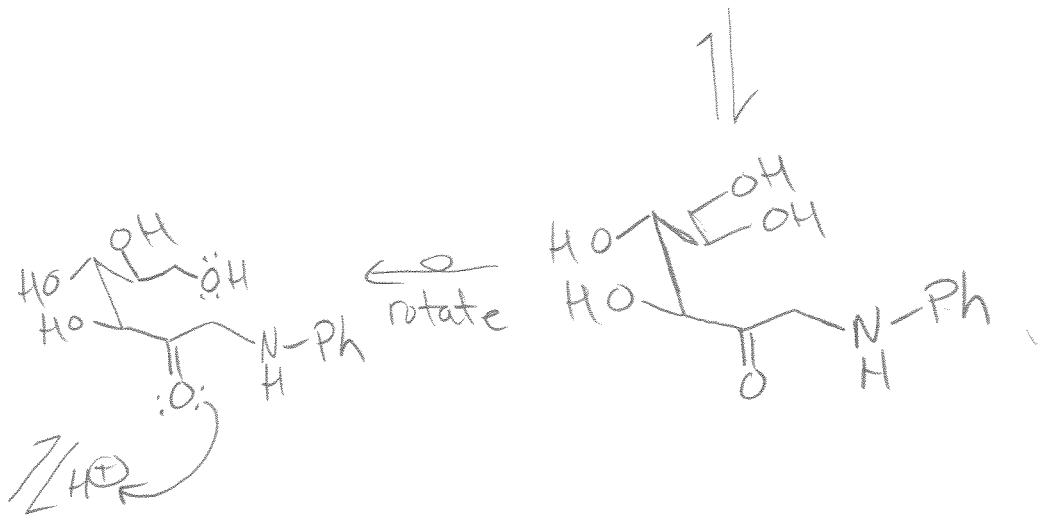
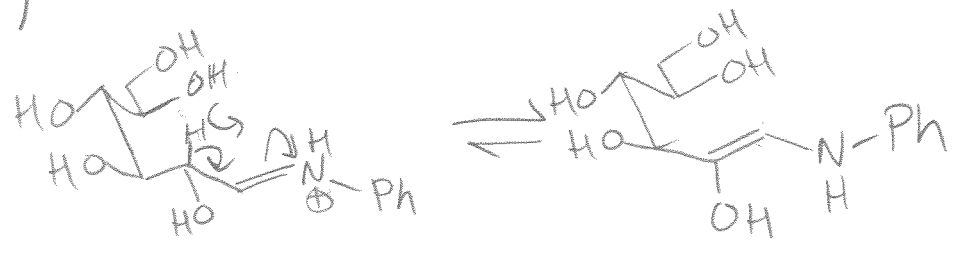




13



15) b) From:

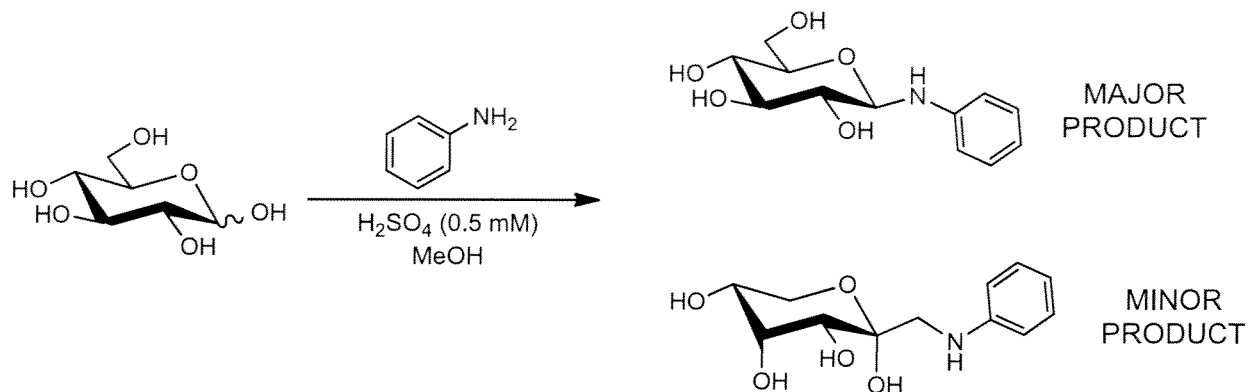


Minor prod.

15) Consider the following reaction with glucose:

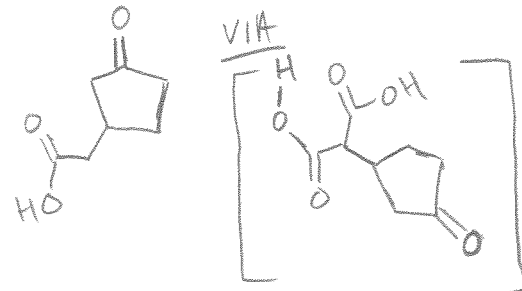
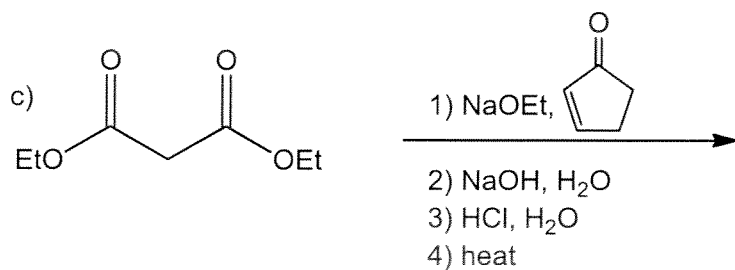
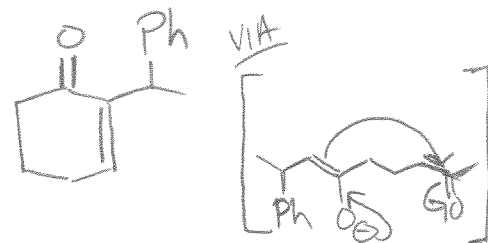
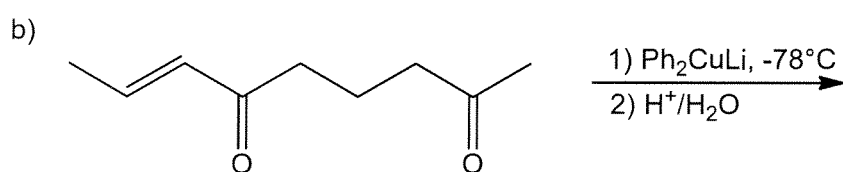
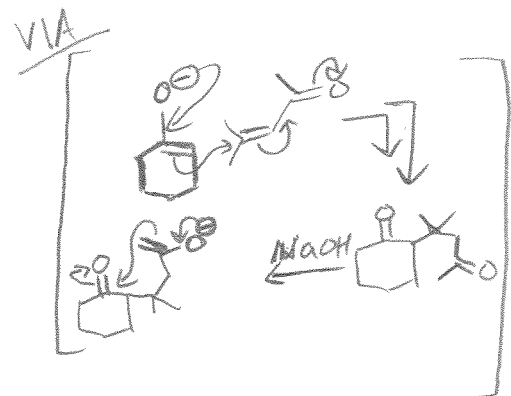
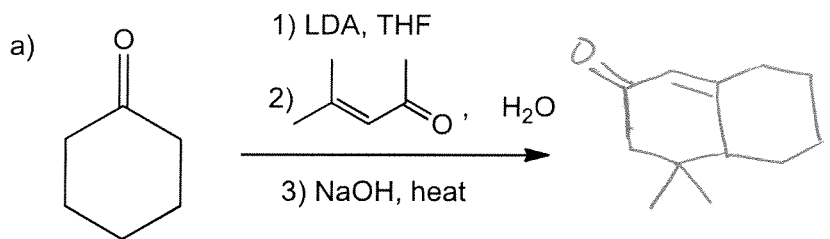
a) Provide a plausible mechanism for the formation of the **MAJOR** product (Hint: Glucose can undergo mutarotation).

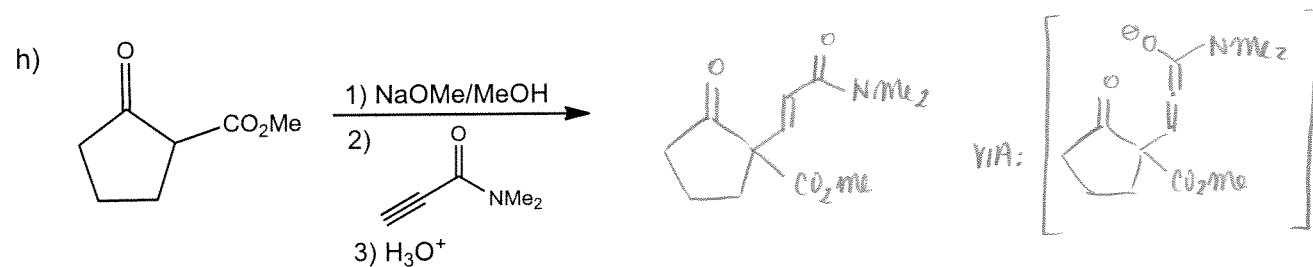
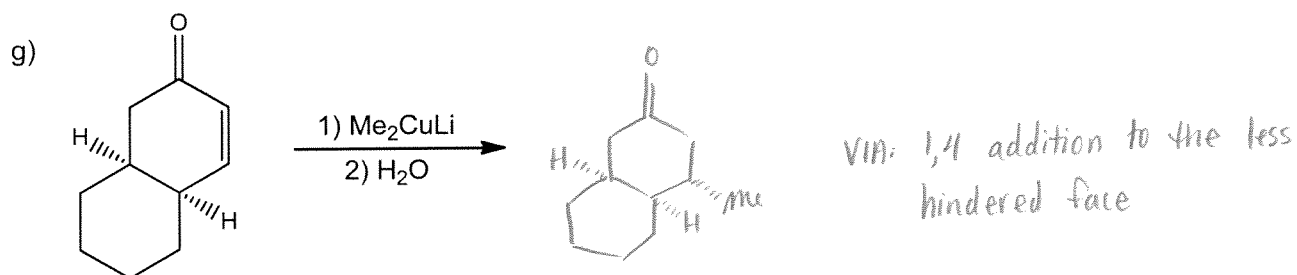
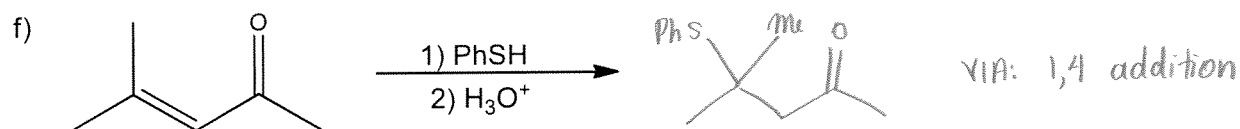
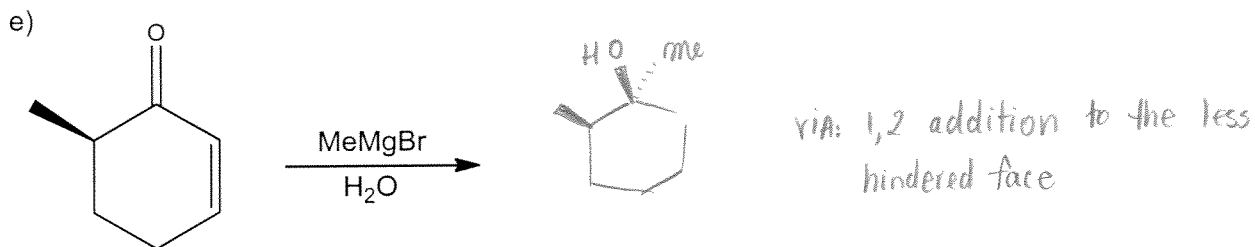
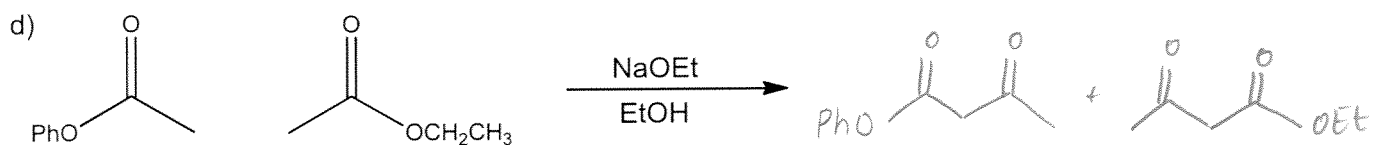
b) The minor product is formed from an intermediate in the mechanism of the major product. Provide a plausible mechanism for the formation of the **MINOR** product.



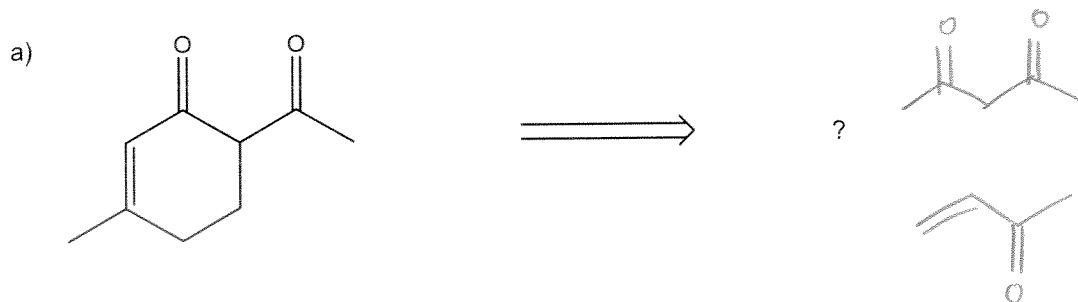
PART B

16) Predict the major product in each of the following reactions:



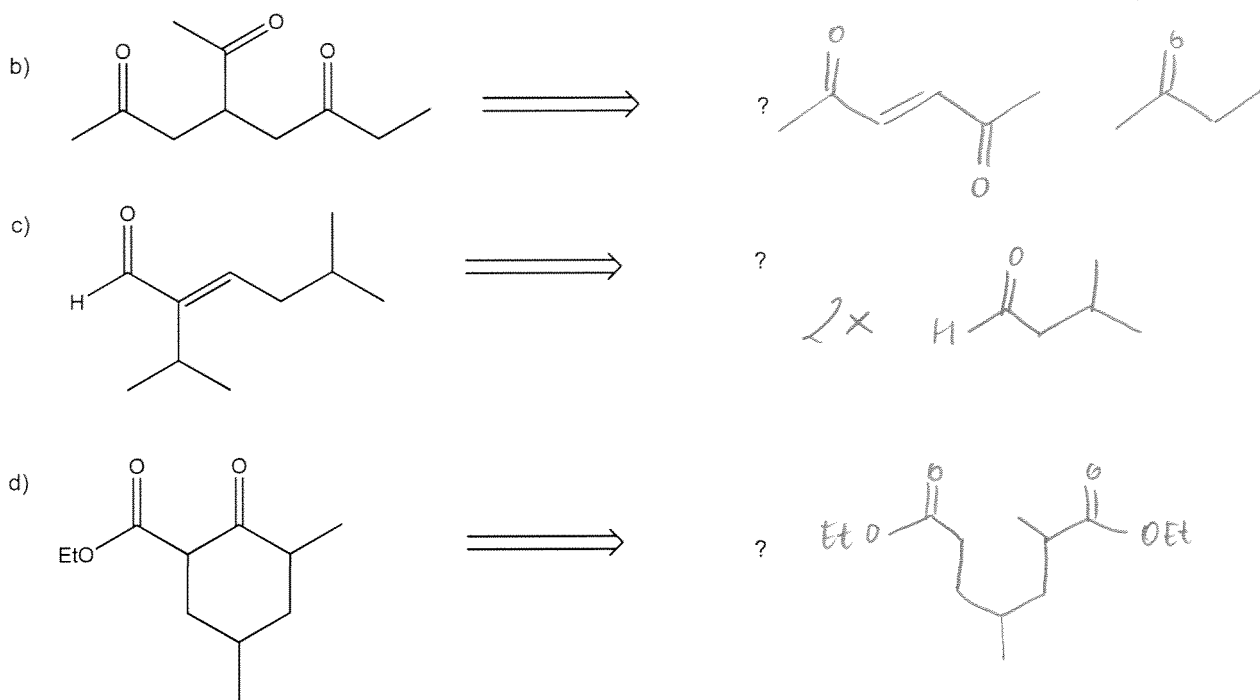


17) Provide the most logical starting materials for the products below. You do not need to include reagents.

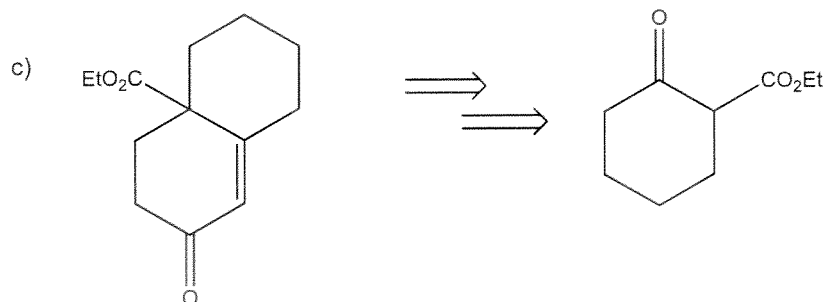
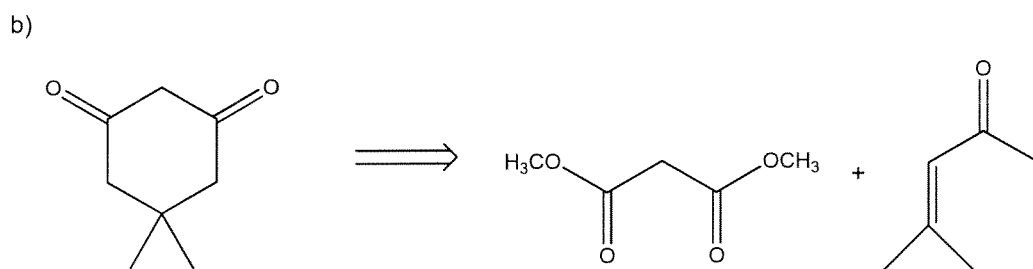
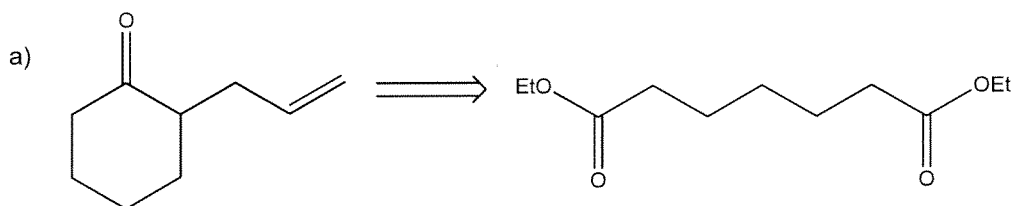


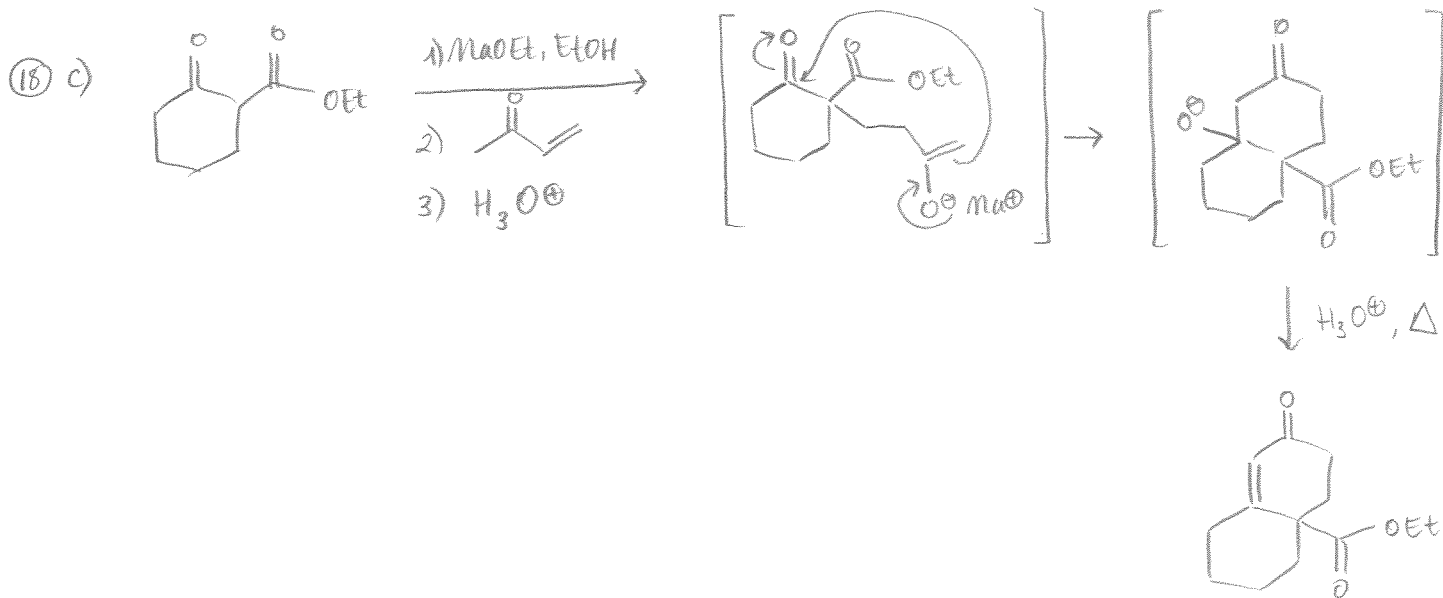
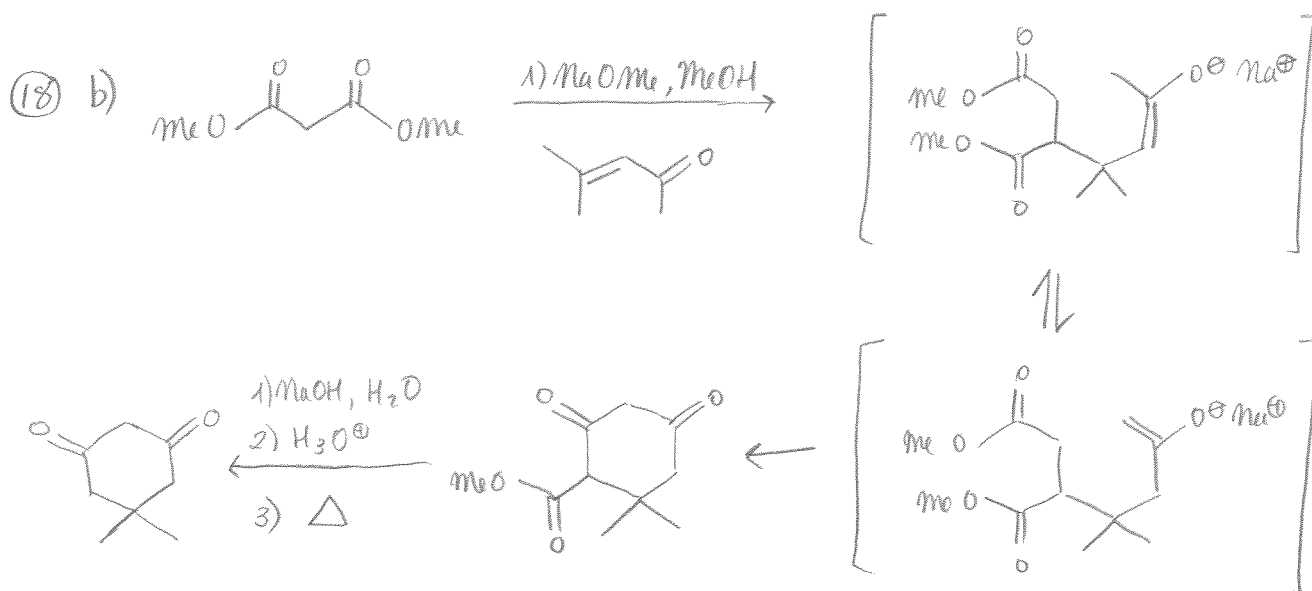
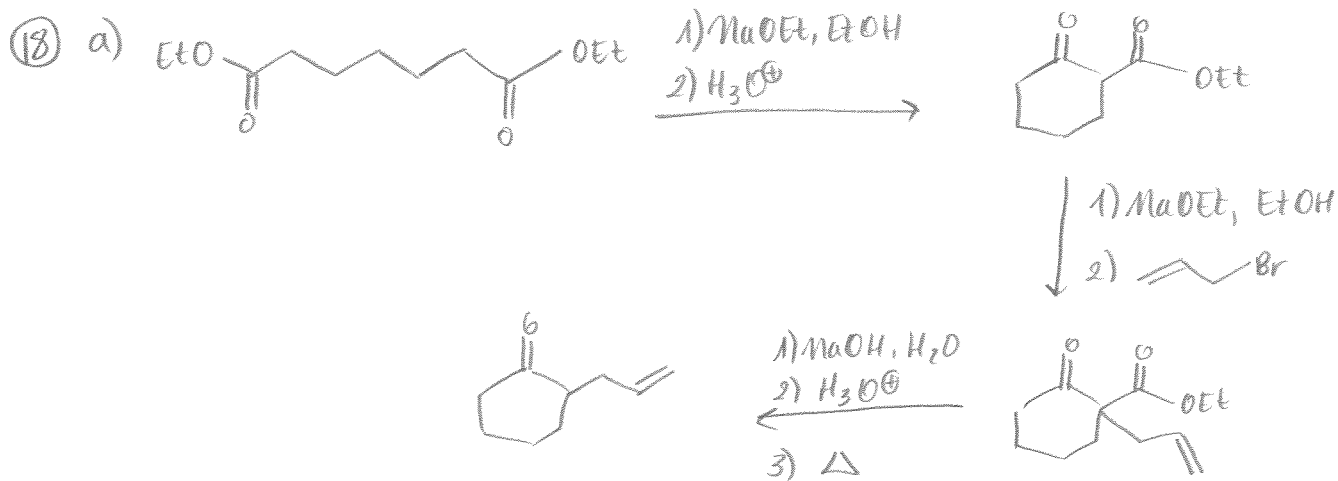
(Robinson Annulation)

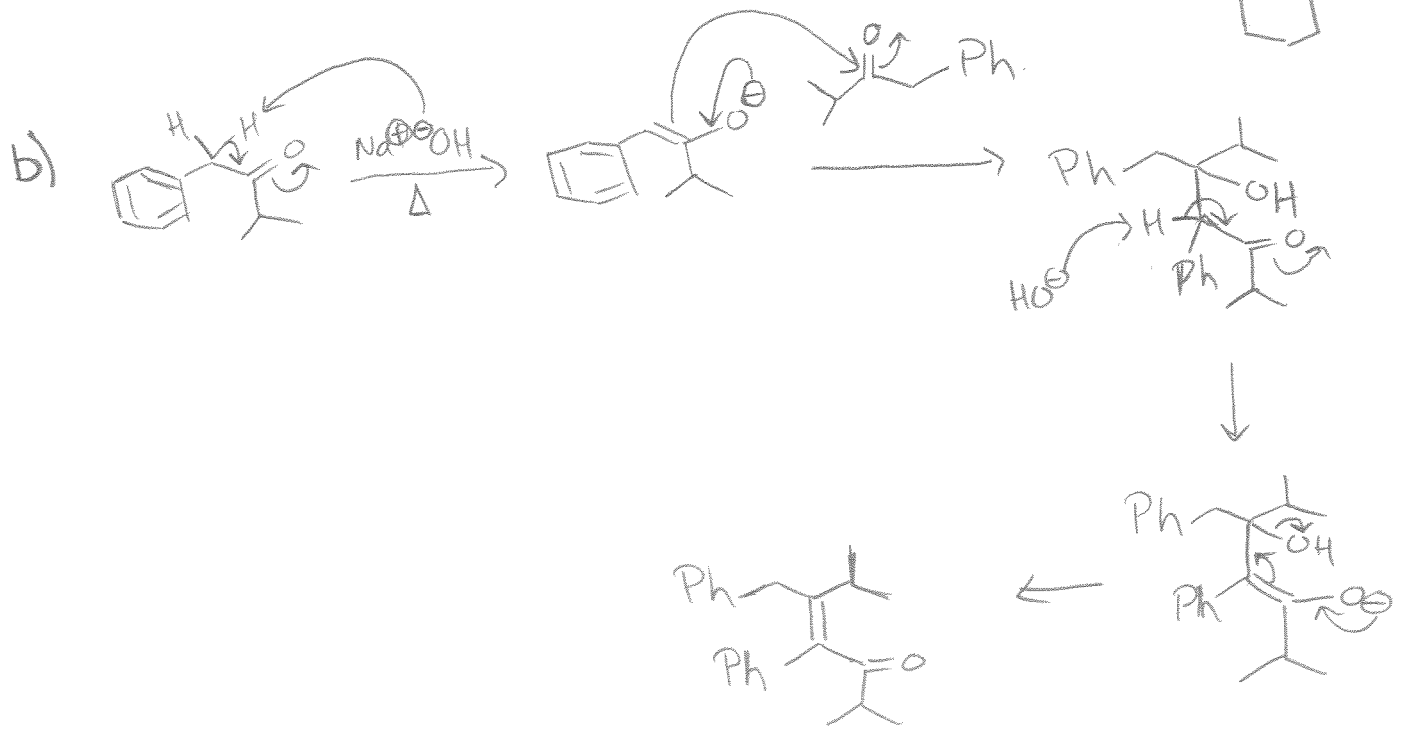
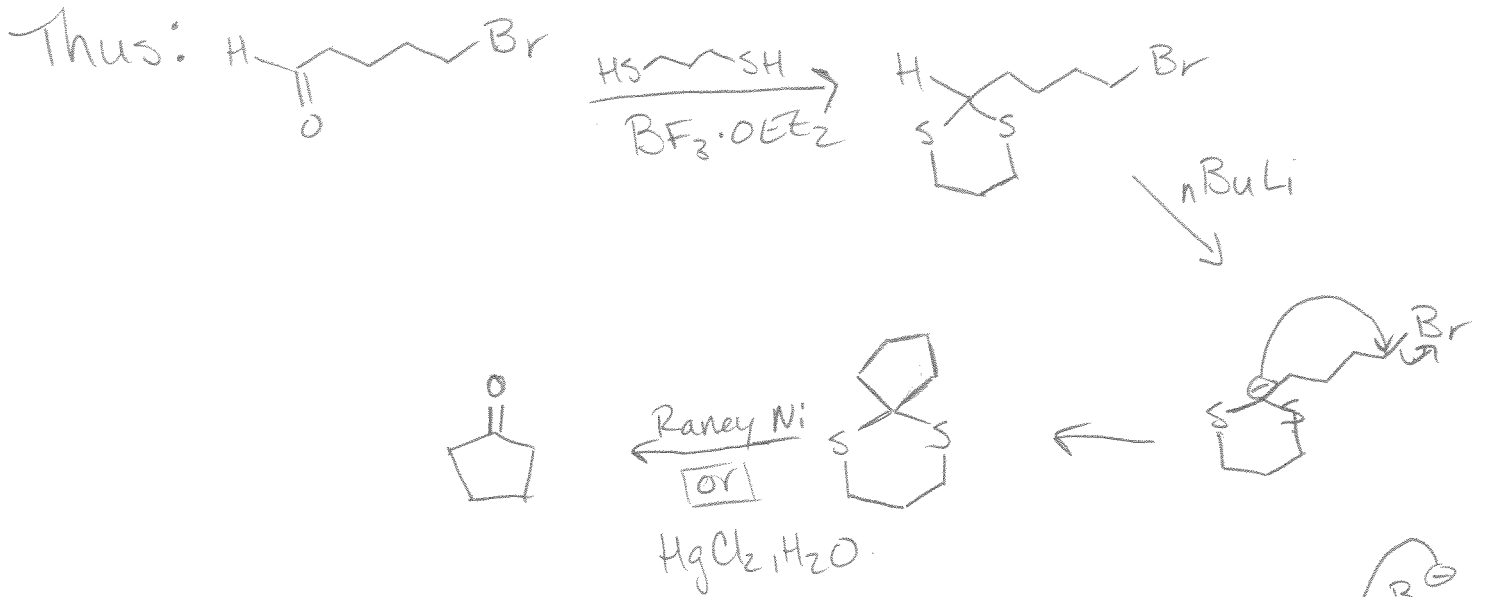
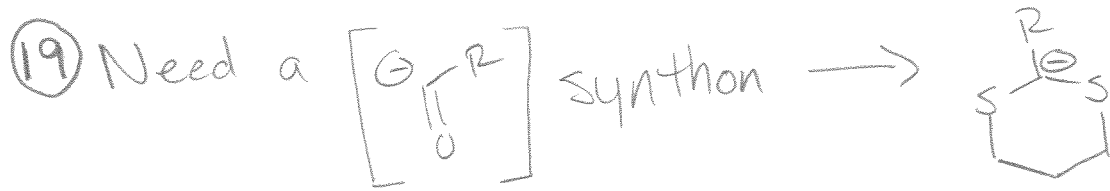
(Michael Addition)

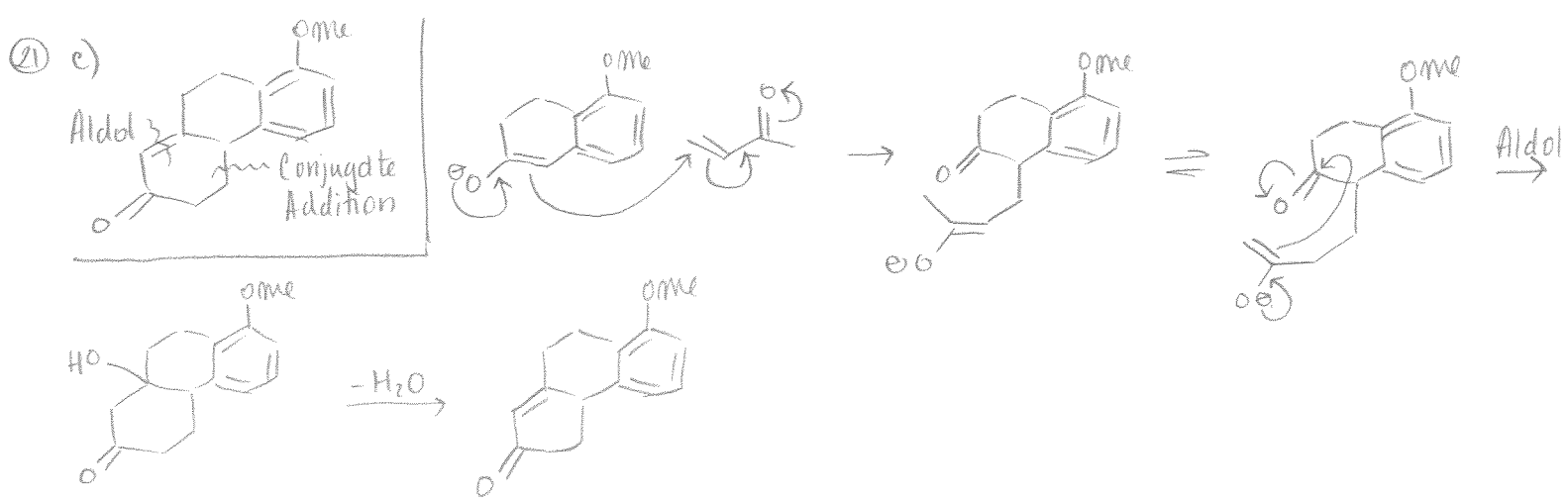
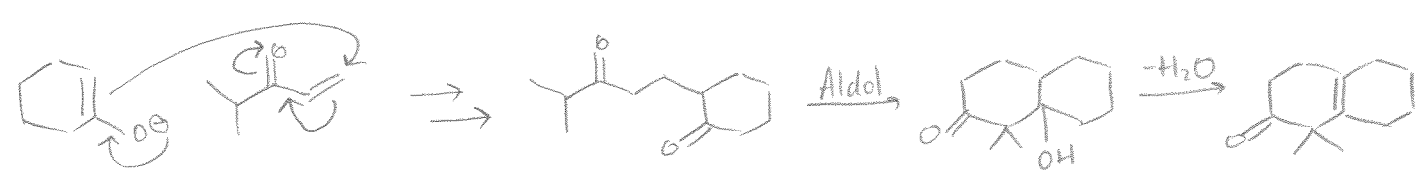
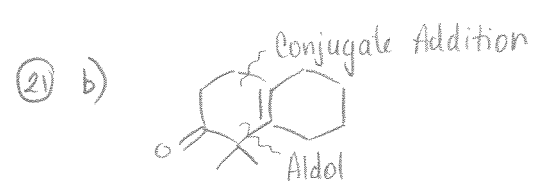
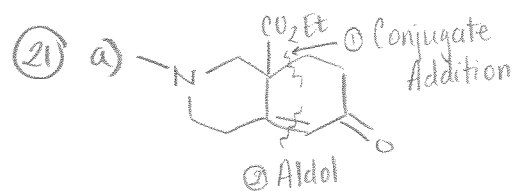
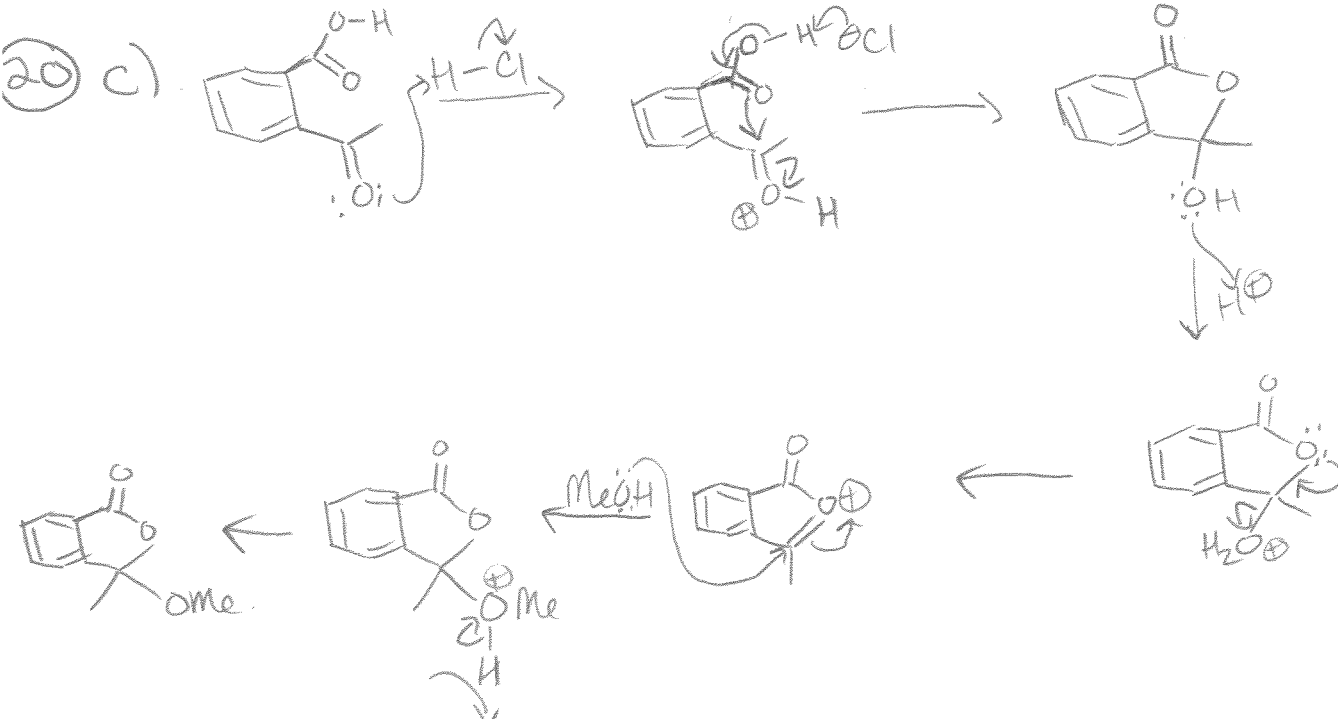


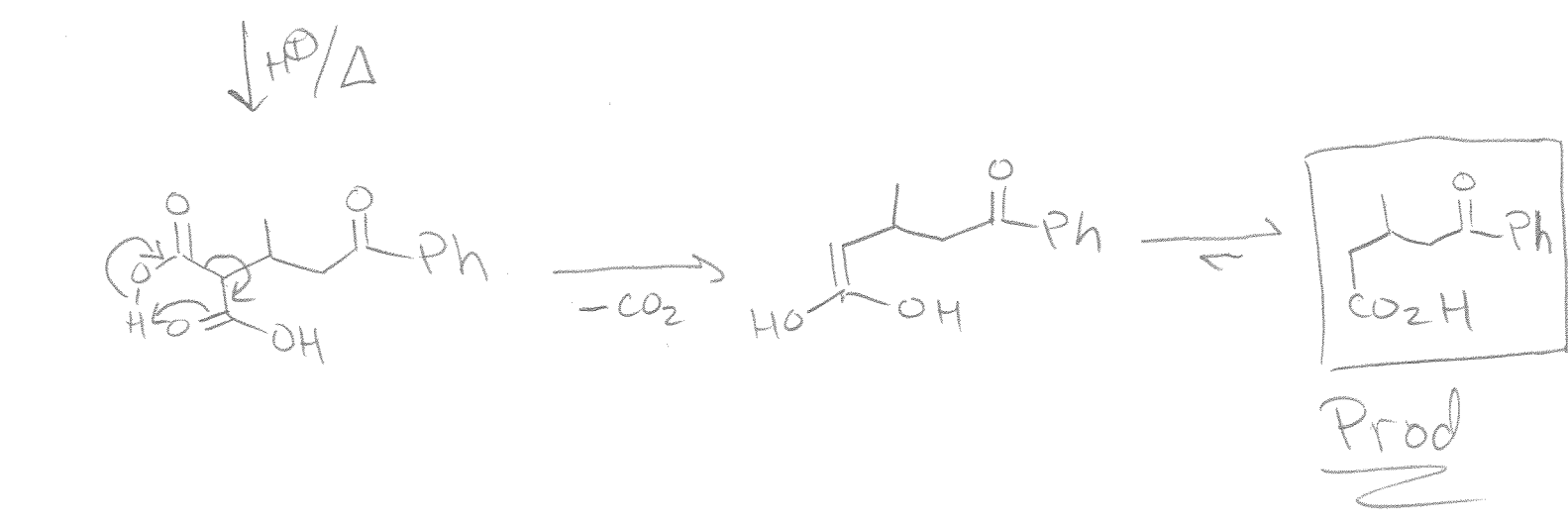
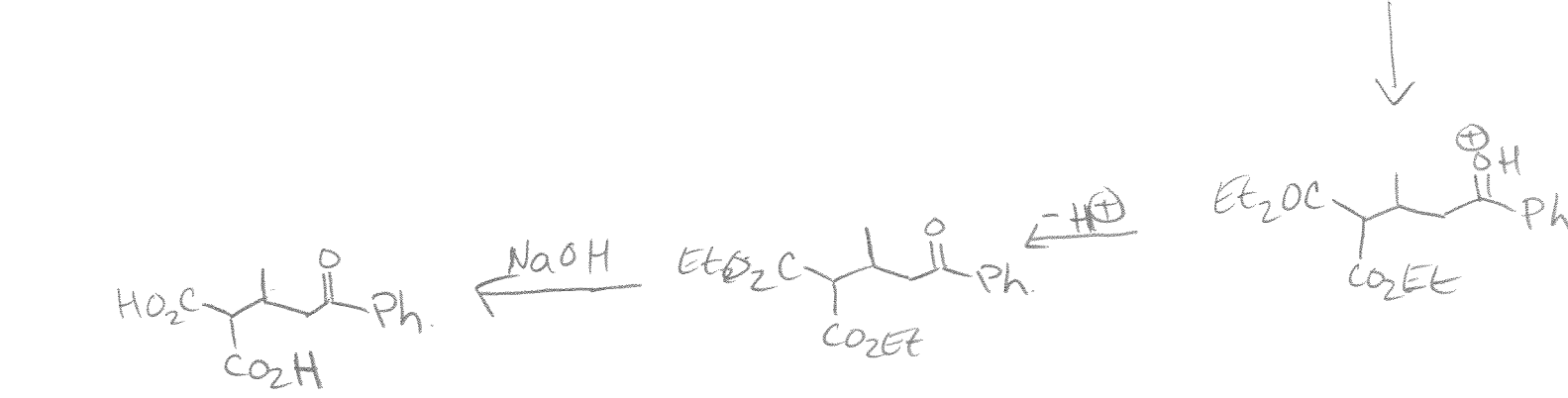
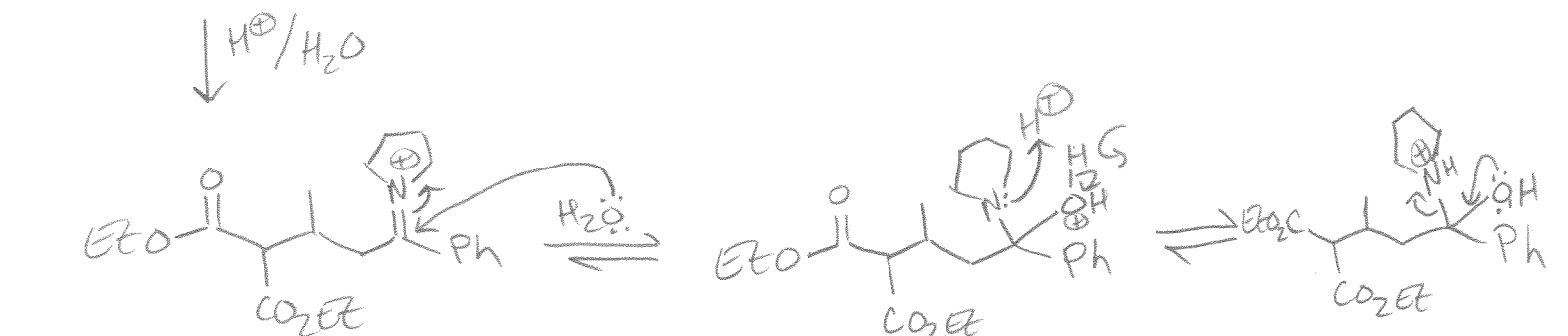
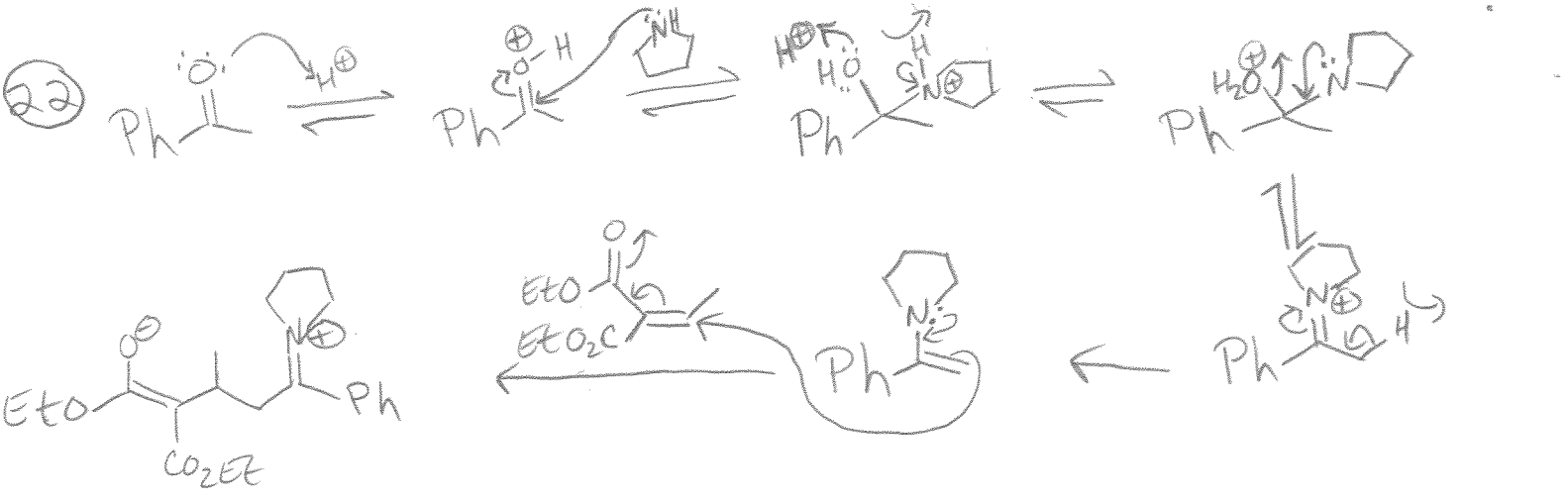
18) Suggest a synthesis of the following molecules from the given starting material. Include all necessary reagents.

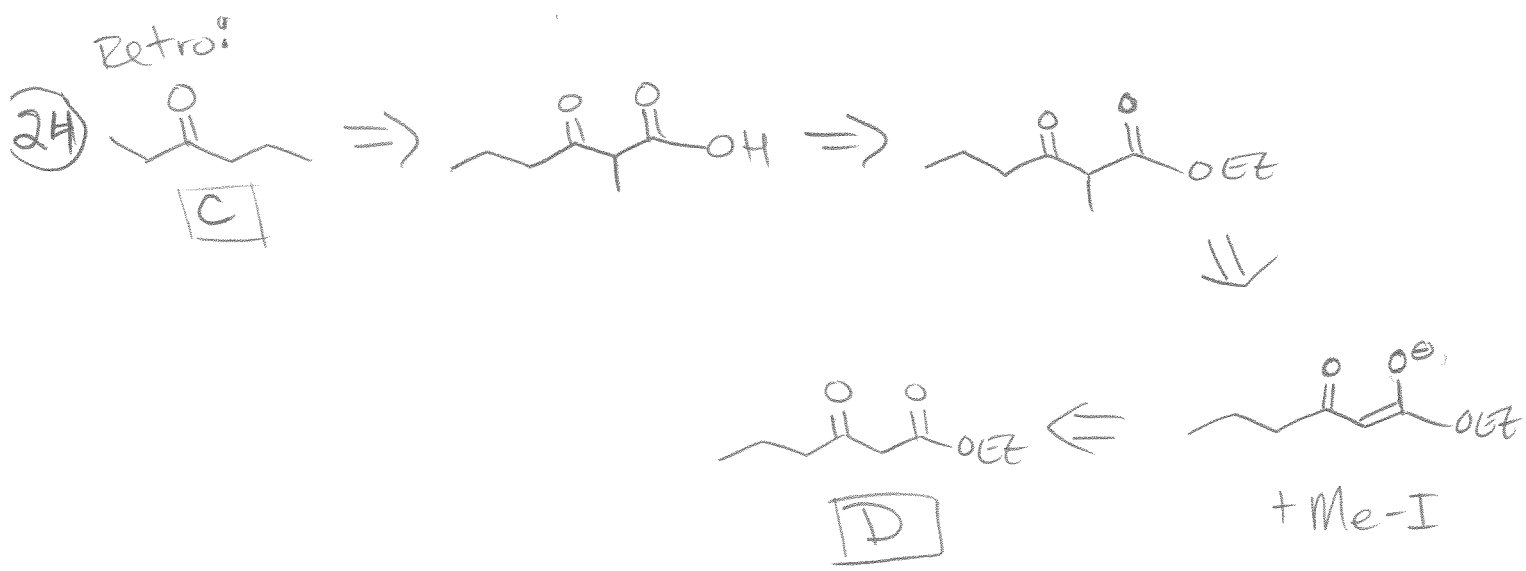
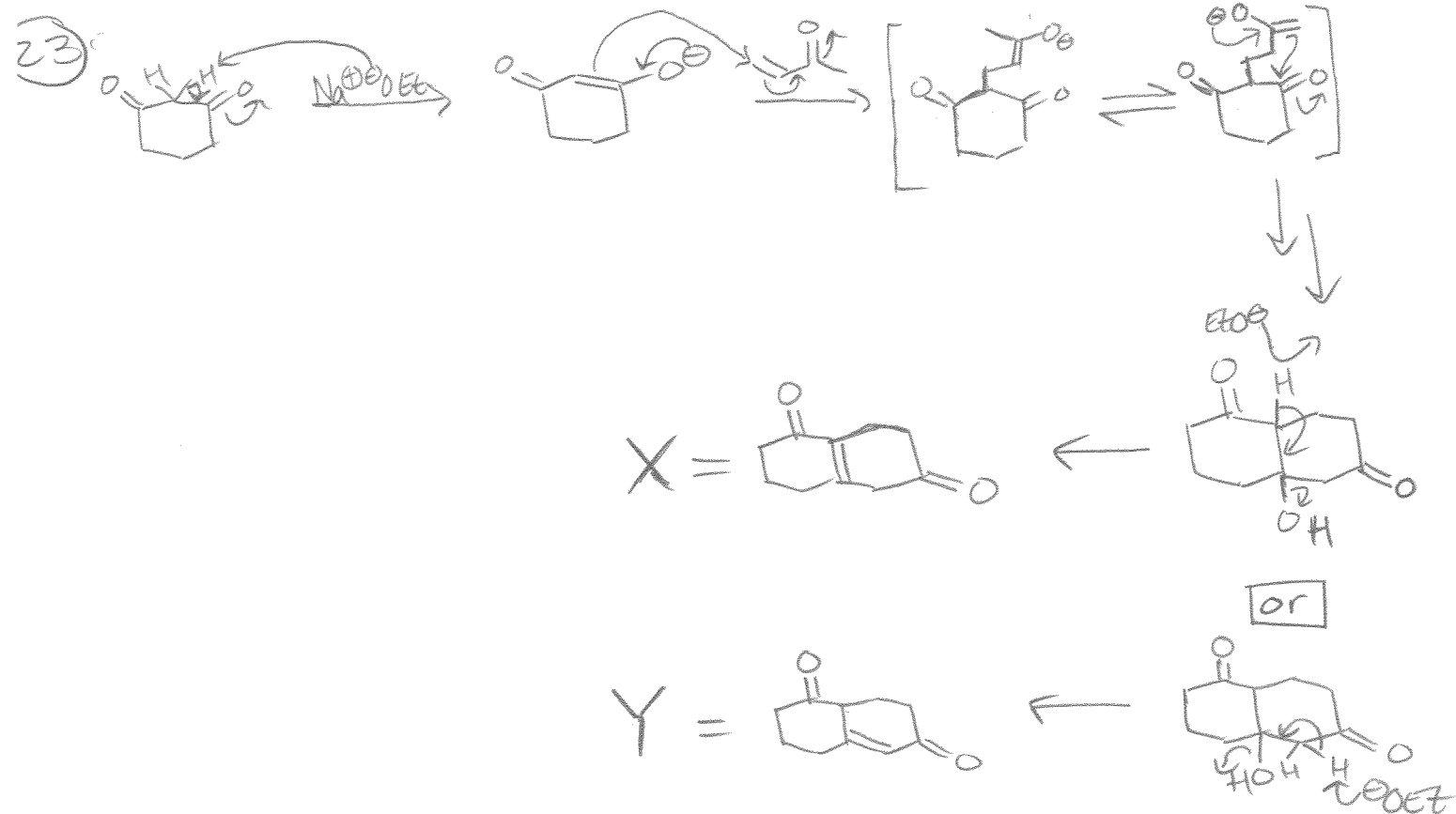




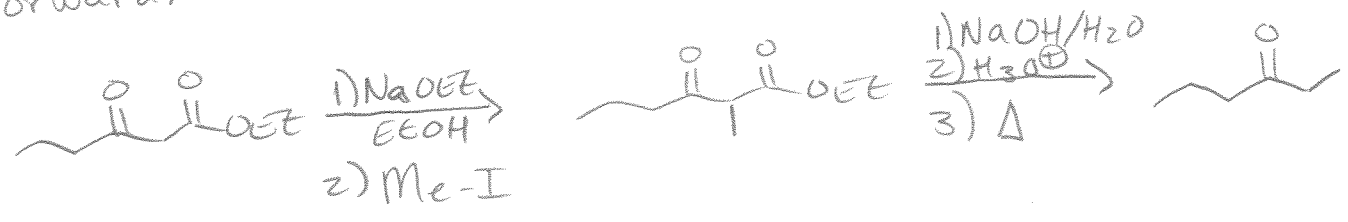




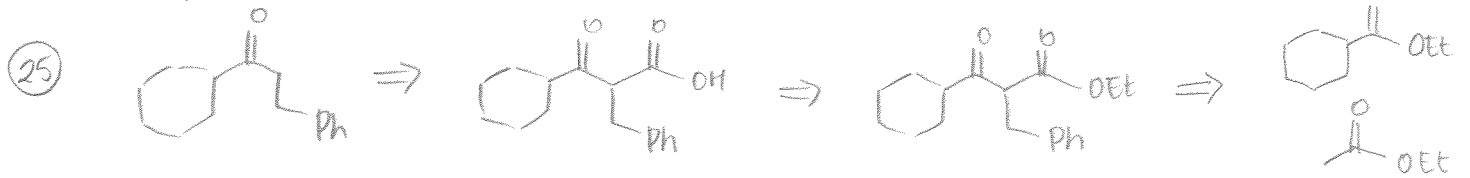




Forward:



Retrosynthesis:



Forward Synthesis:

