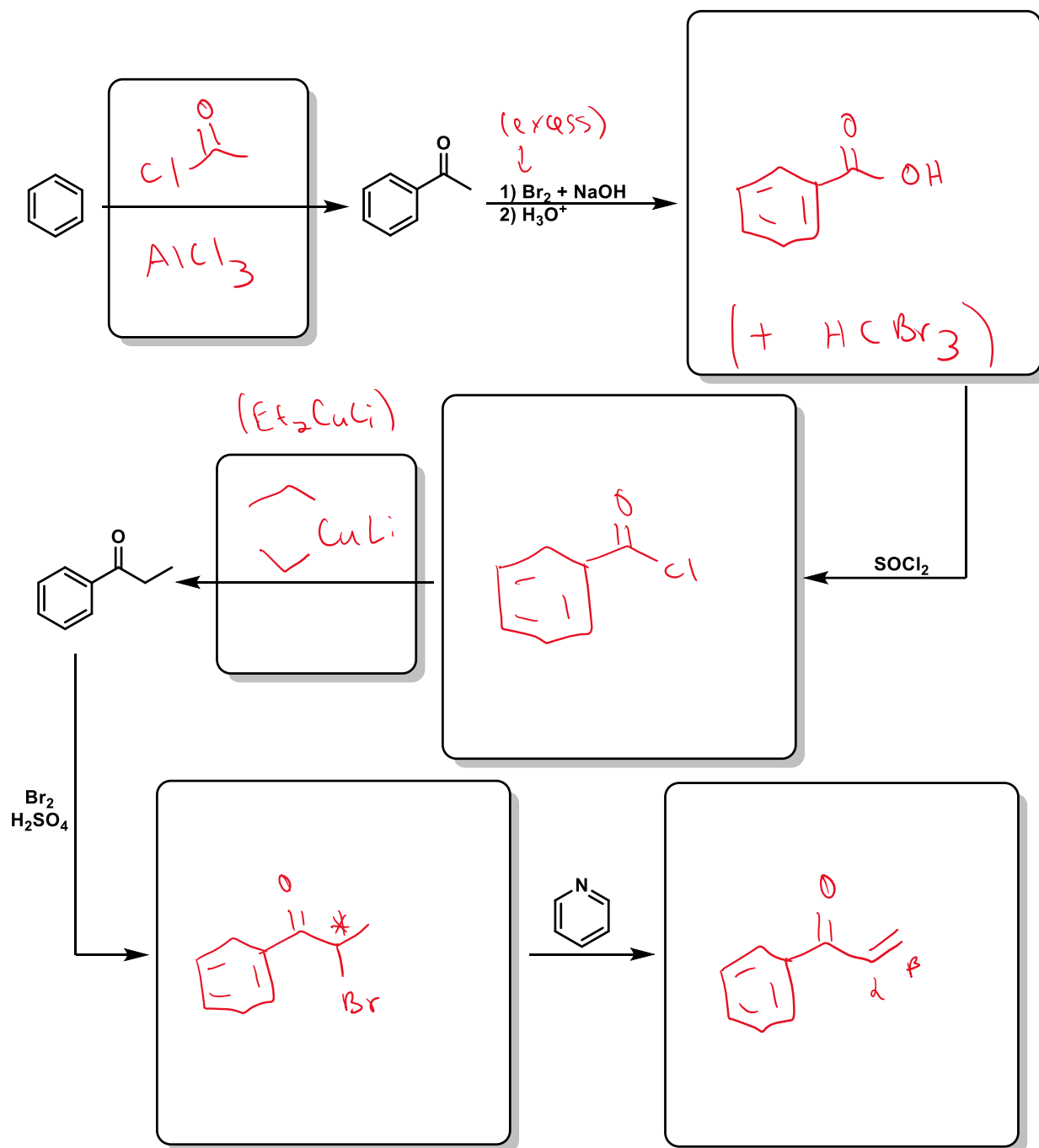
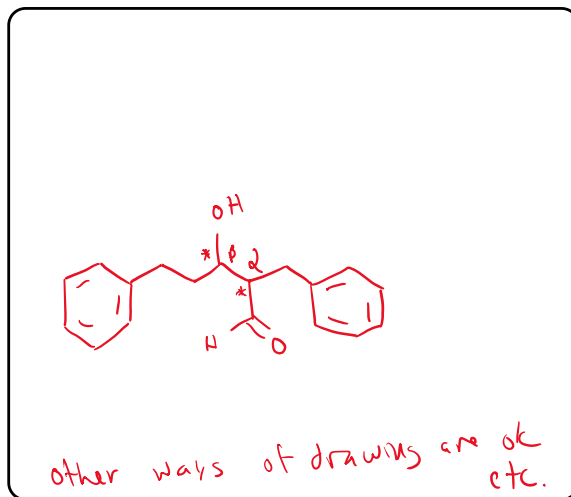
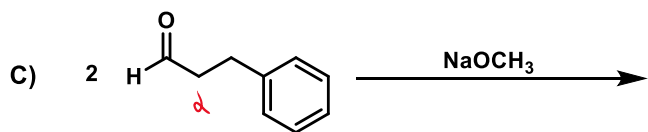
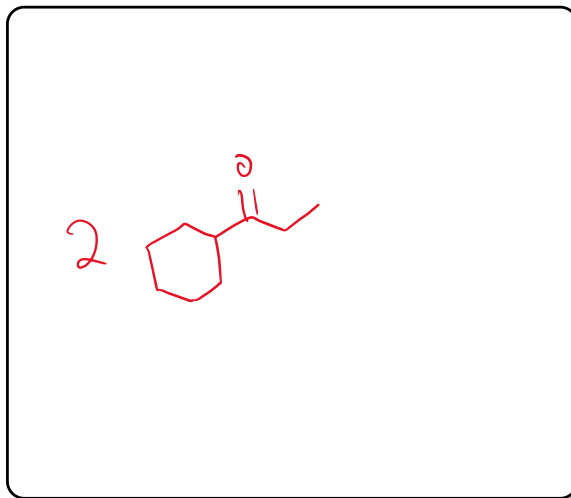
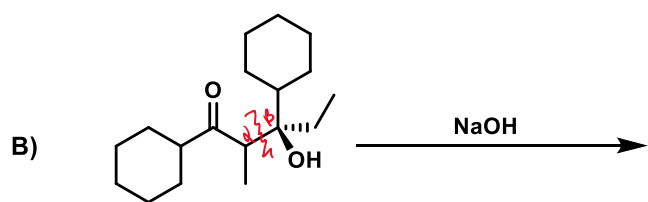
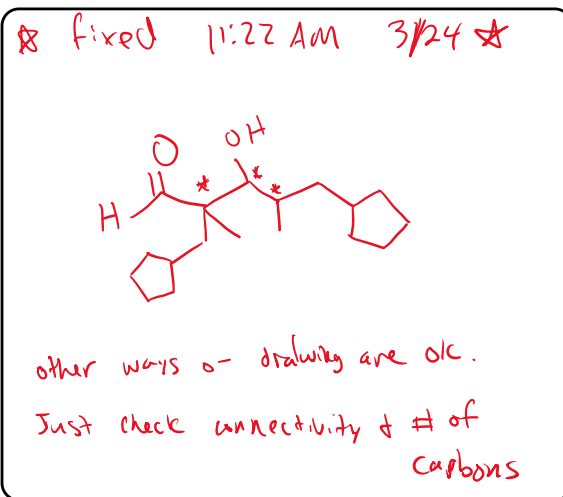
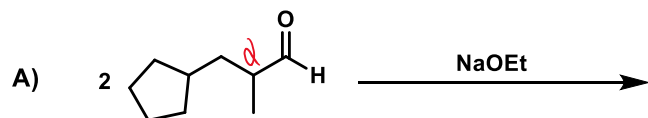


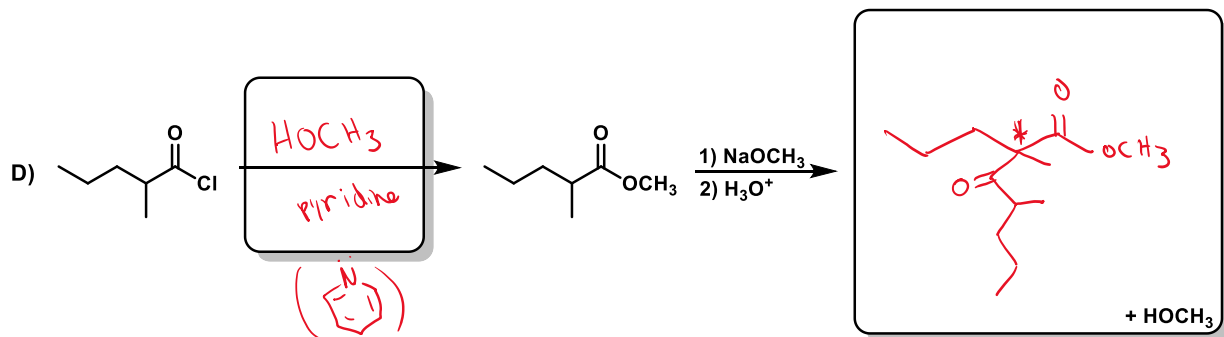
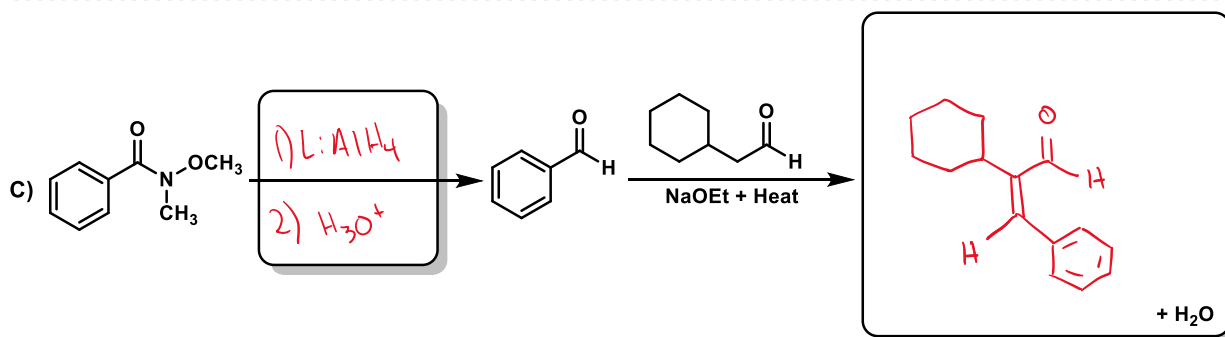
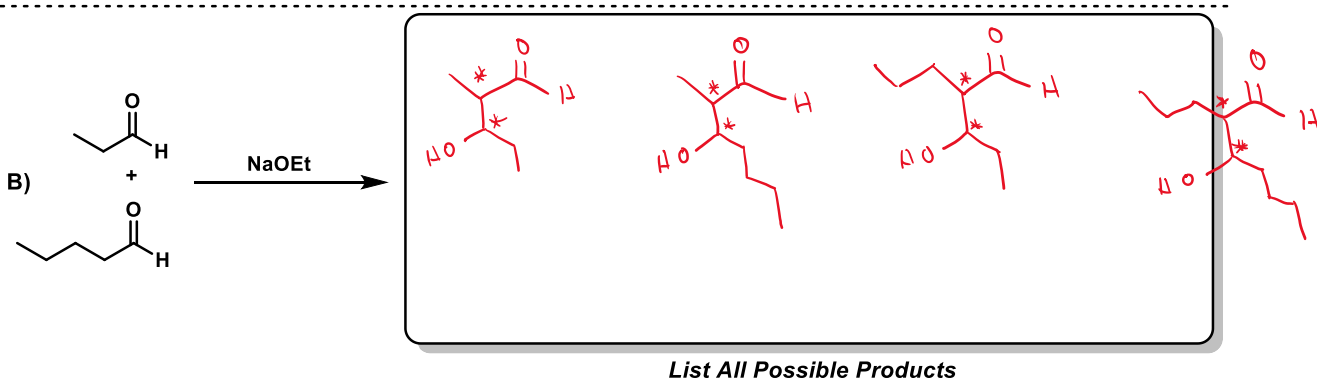
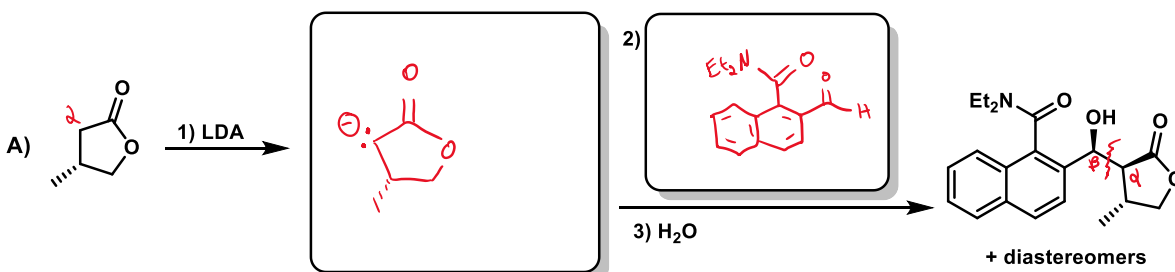
1. Fill in the boxes with the correct intermediates / reagents / products for the following synthesis.



2. Fill in the final products you would expect from the following Aldol and Retro Aldol reactions.



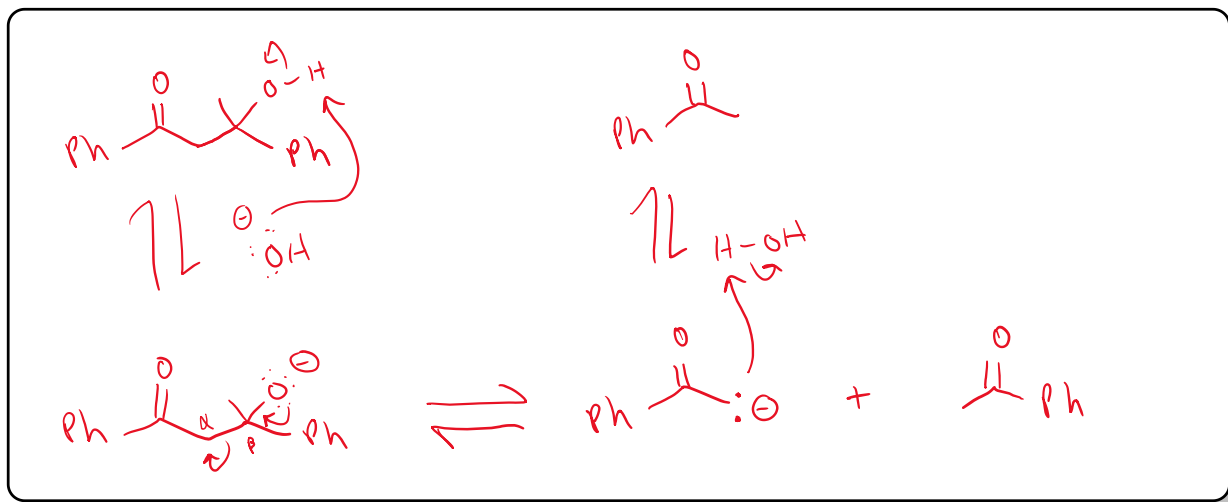
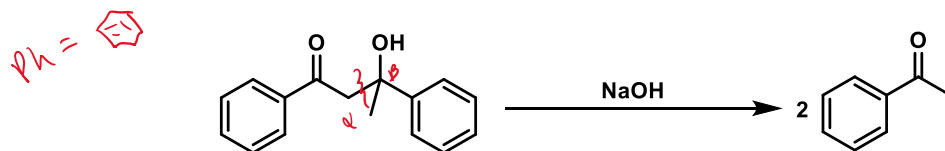
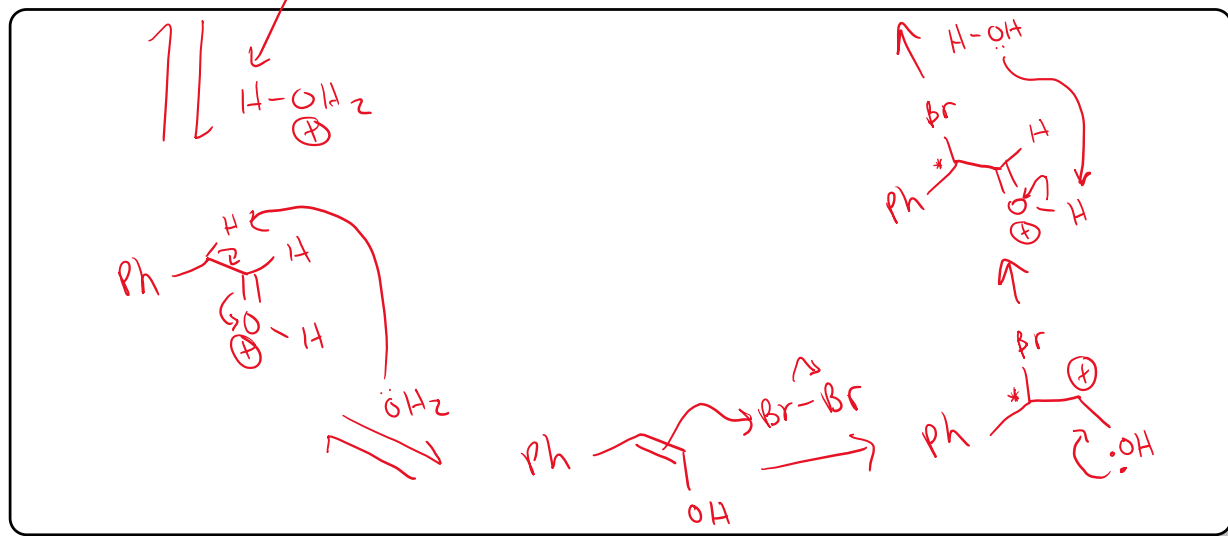
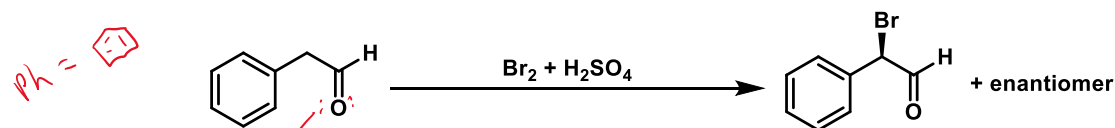
3. Fill in the boxes with the correct intermediates / reagents / products for the following syntheses.



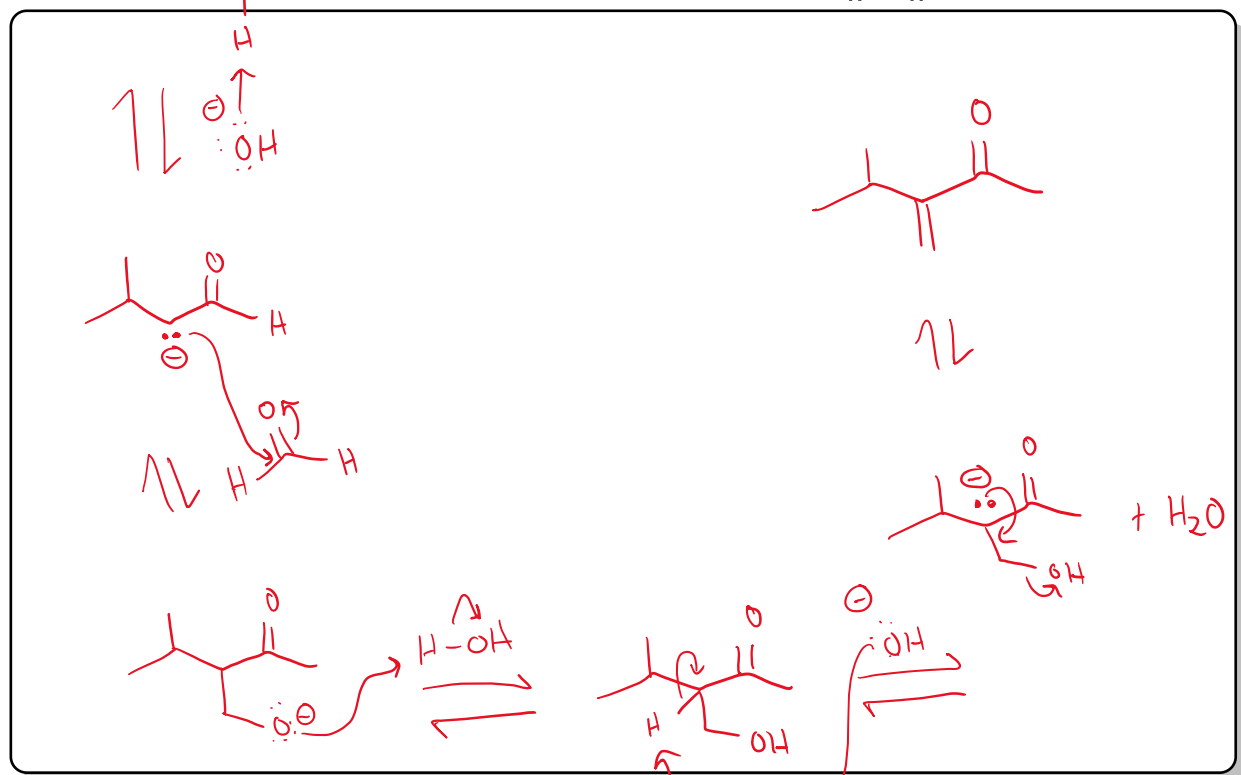
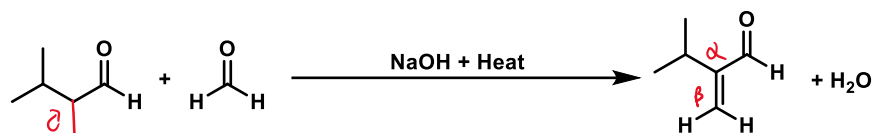
Other ways to
draw, etc.!

equilibrium arrows are not required (if you promise to remember that many of these steps are quite reversible)

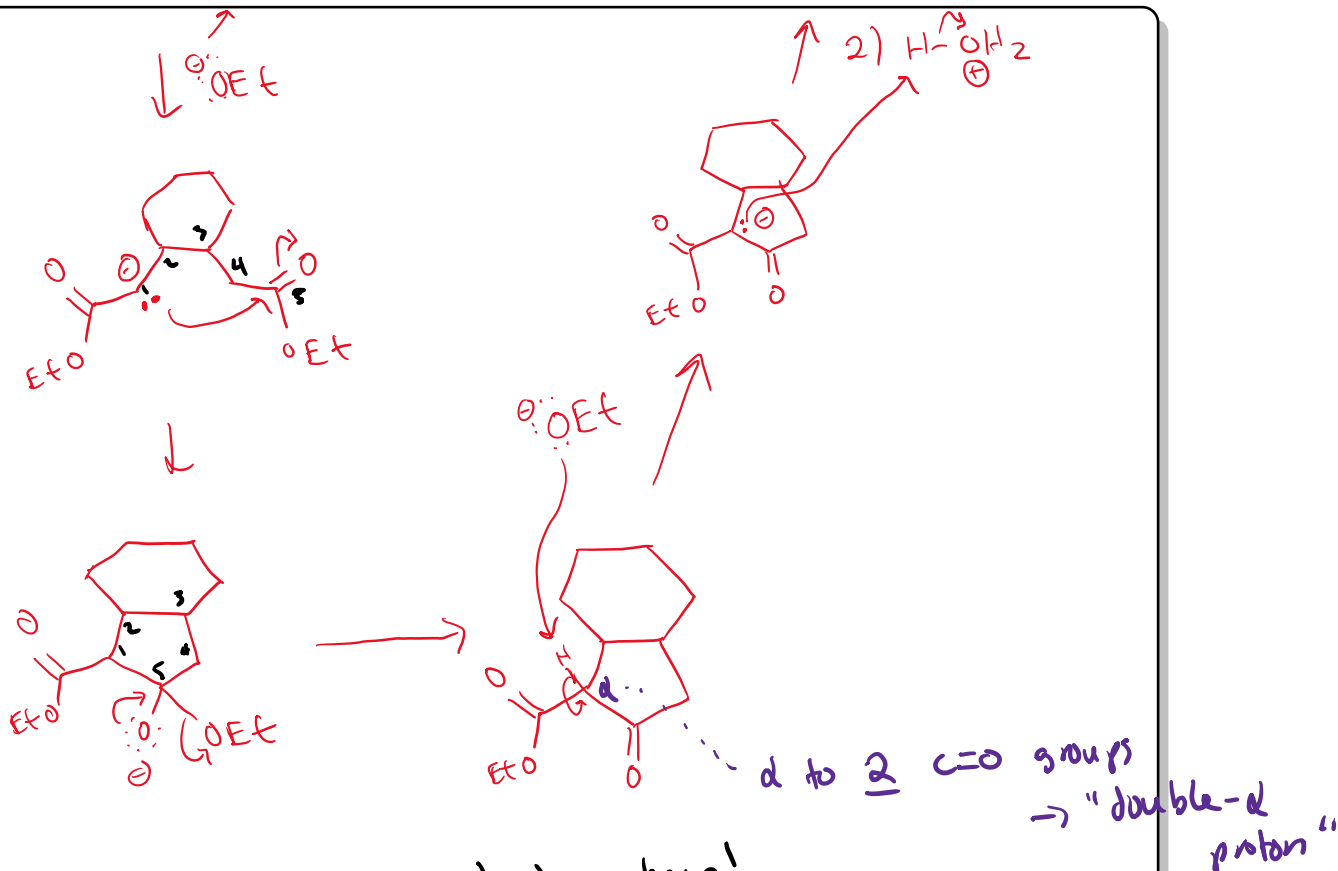
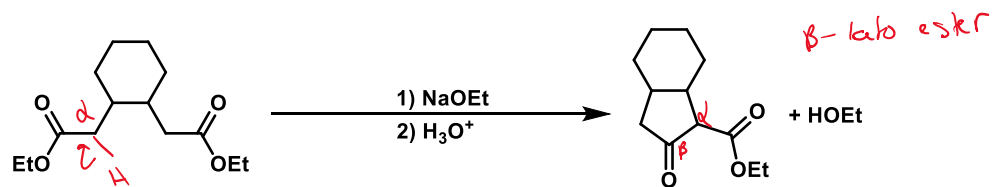
4. **Mechanisms.** Provide a step-wise mechanism for the following transformations.



making an α -carbanion as a leaving group!



Intramolecular claisen!



not done here!
 because OEt^- is nearby
 + the new "double- α " proton
 is very acidic! $\text{pK}_a \sim 9$
 - hence why we need $2) \text{H}_3\text{O}^+$
 to quench the reaction!