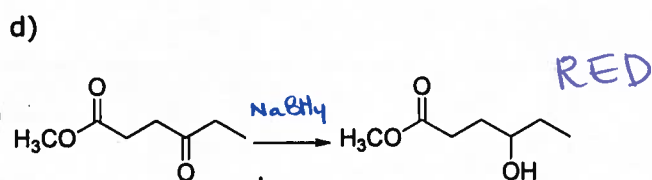
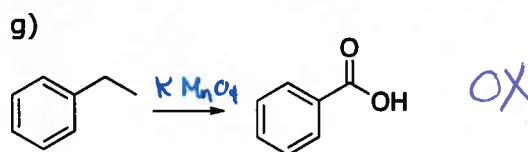
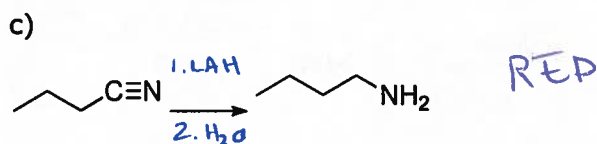
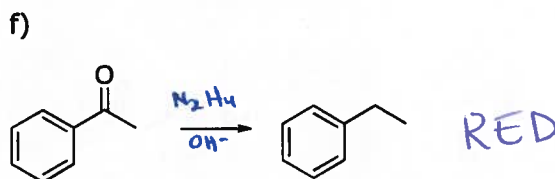
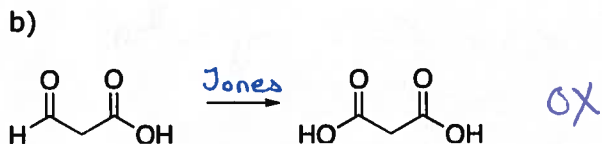
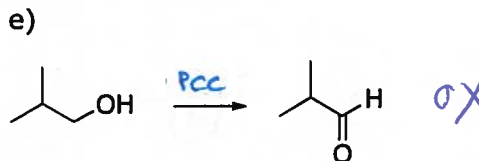
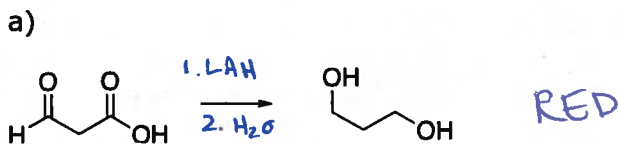
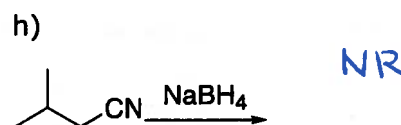
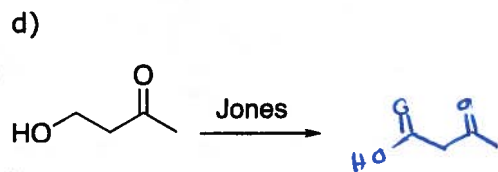
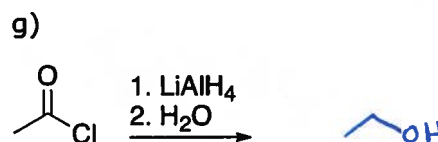
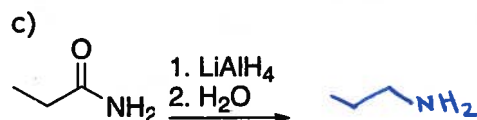
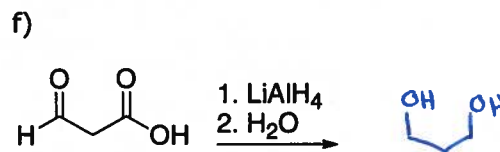
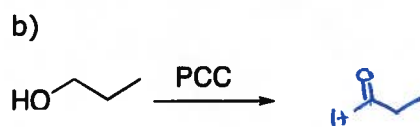
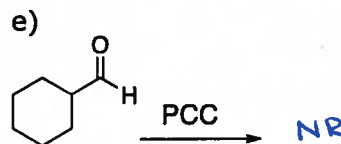
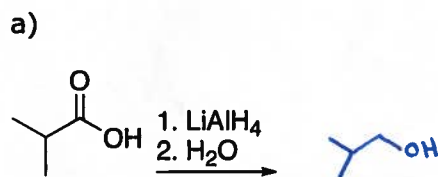


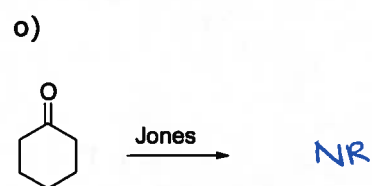
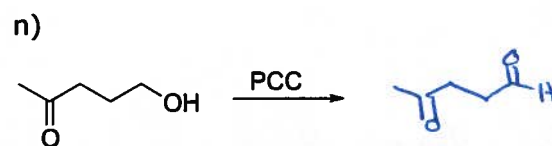
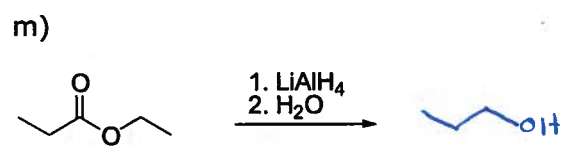
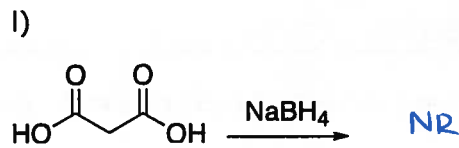
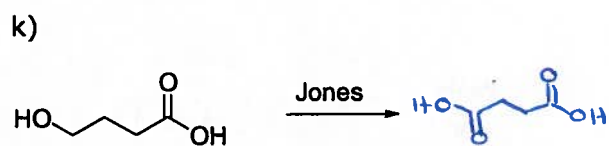
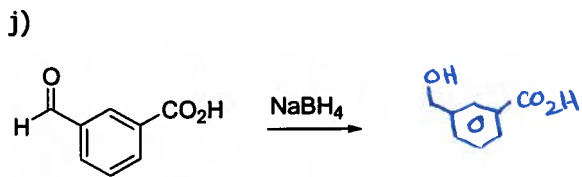
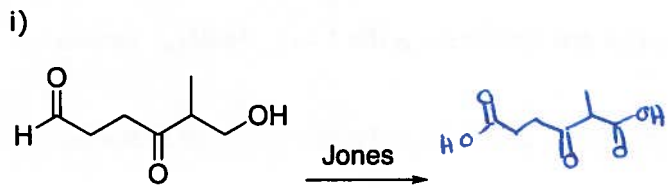
**18A. Predict the product of redox reactions of carbonyl compounds with LAH, NaBH<sub>4</sub>, Jones, PCC.**

18A.1 Determine if the following are oxidation or reductions then determine the appropriate reagent.



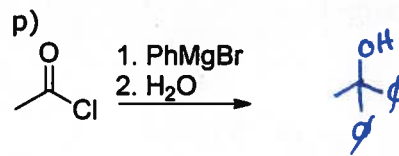
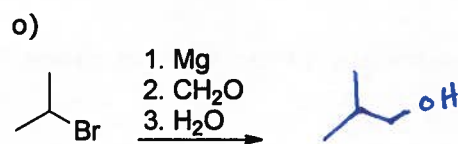
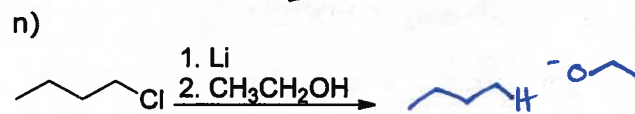
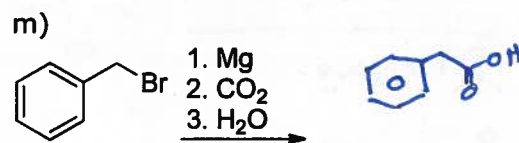
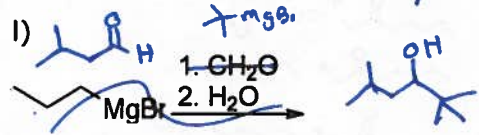
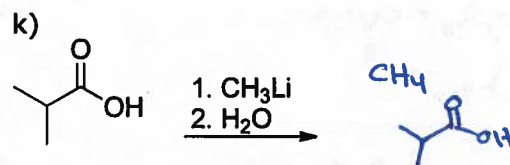
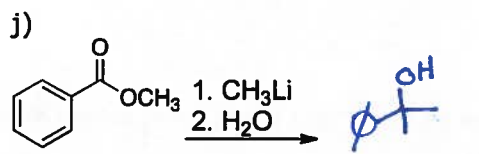
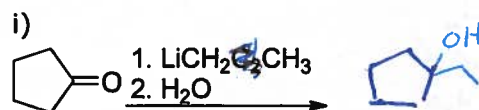
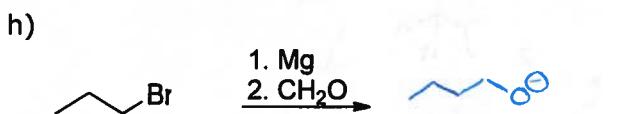
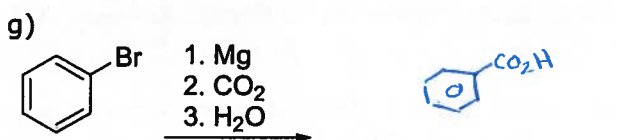
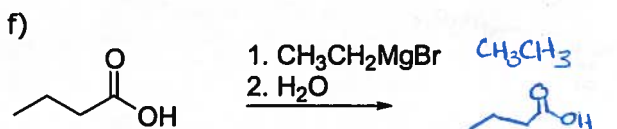
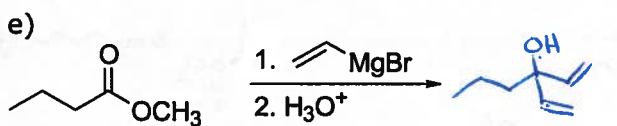
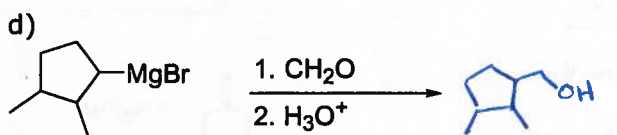
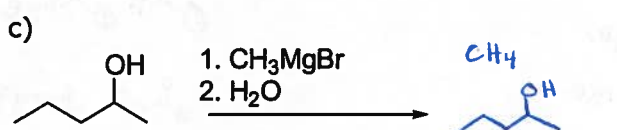
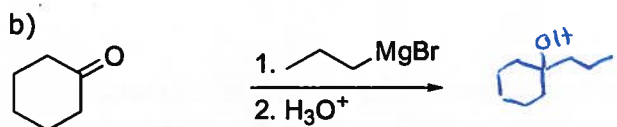
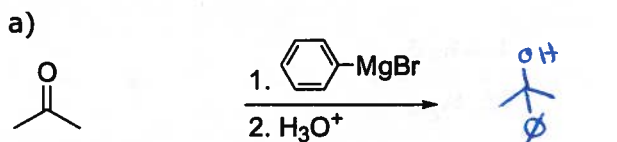
18A.2 Draw the product of the following reactions or write "NR" if no reaction.



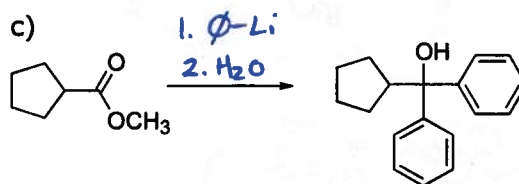
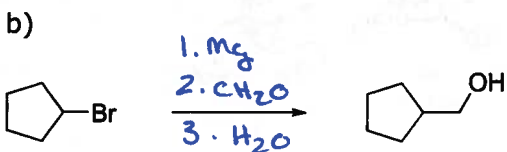
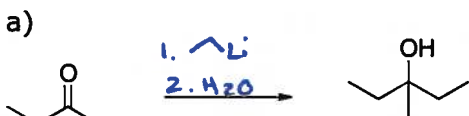


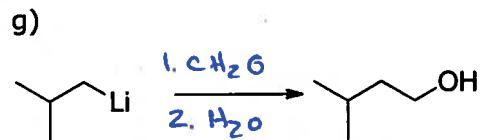
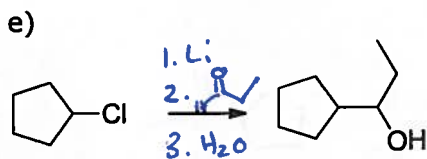
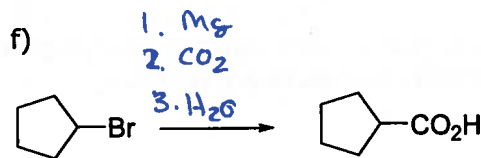
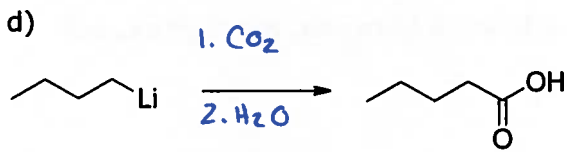
**18B. Predict product of Grignard and organolithium reagents with ketones, aldehydes, acid chlorides, esters, and carbon dioxide.**

18B.1 Predict the products for the following:

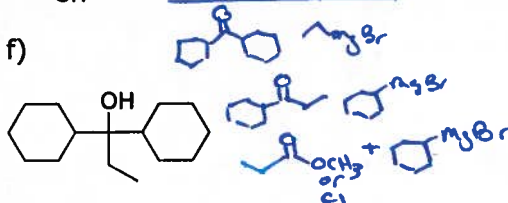
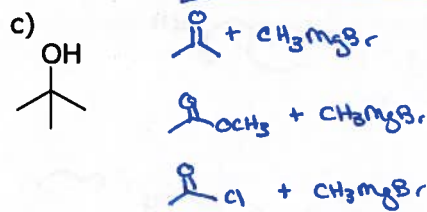
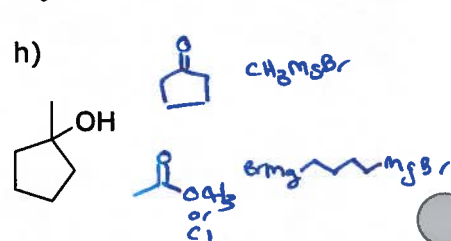
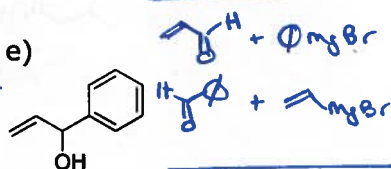
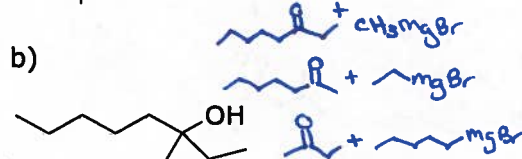
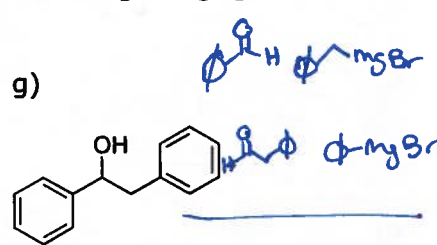
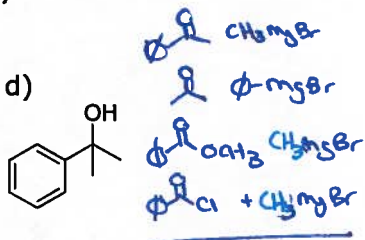
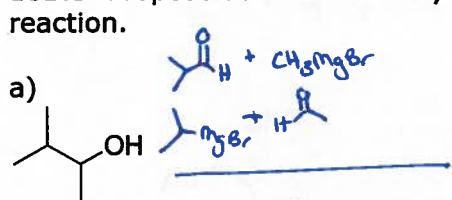


18B.2 Propose reagents for each of the following transformations.



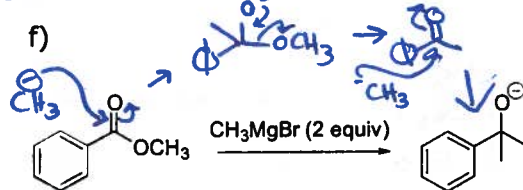
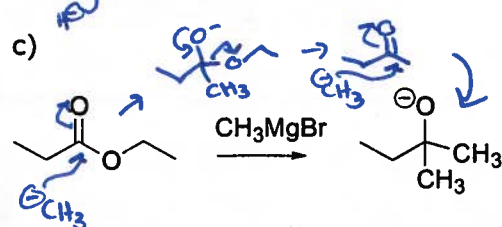
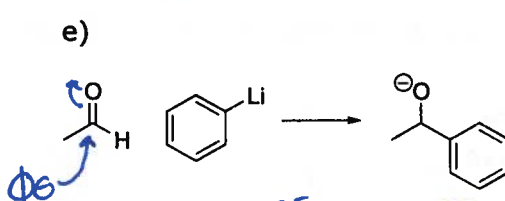
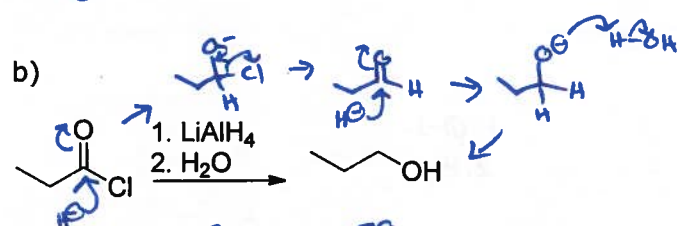
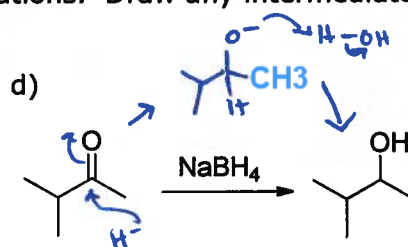
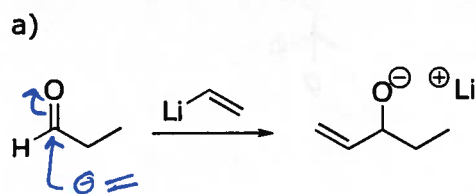


18B.3 Propose at least two ways to synthesize each of the following molecules using the grignard reaction.

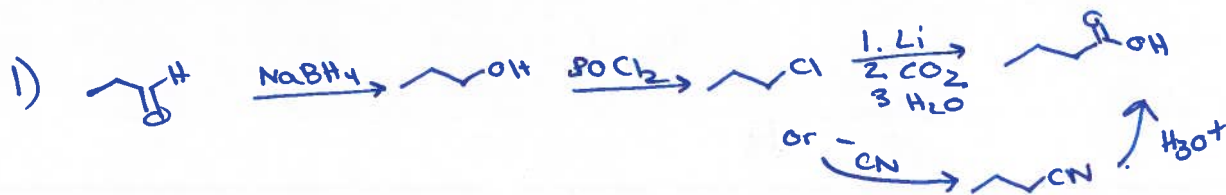
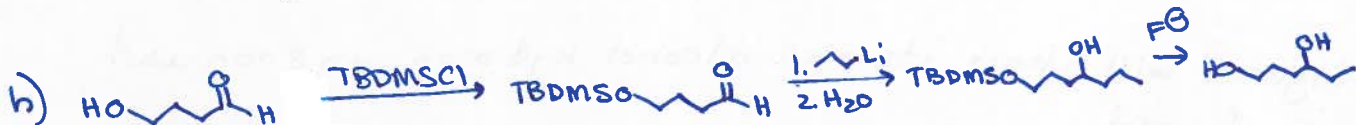
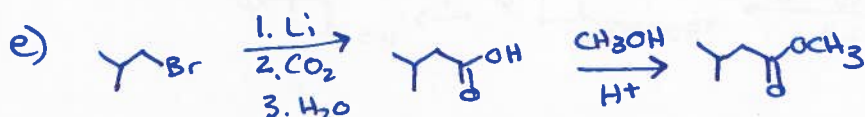
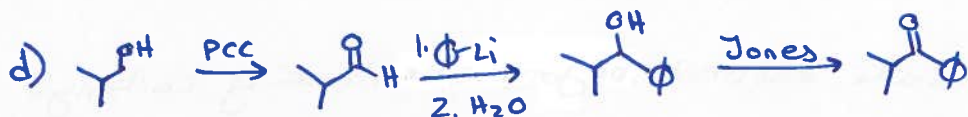
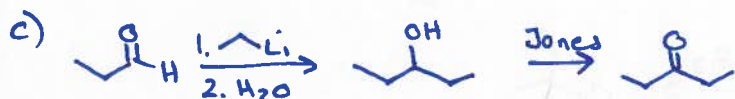
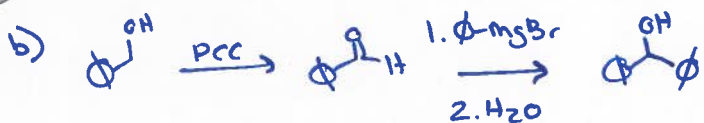
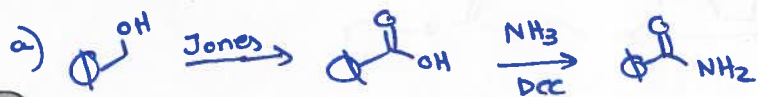


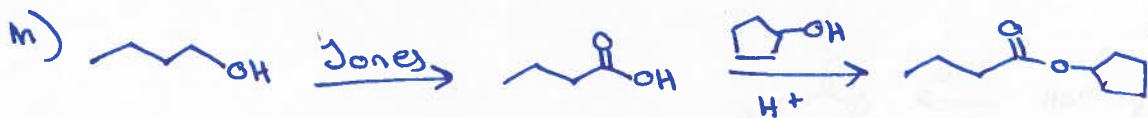
18C. Draw the mechanism of hydride reduction and Grignard or organolithium addition to aldehydes, ketones, acid chlorides and esters

18C.1 Provide a mechanism for the following transformations. Draw any intermediates and use curved arrows to show electron flow



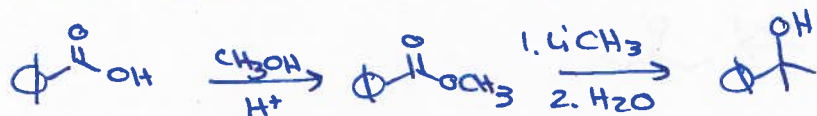
18D.1



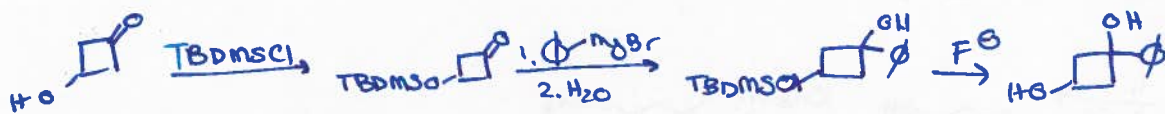


18D.2

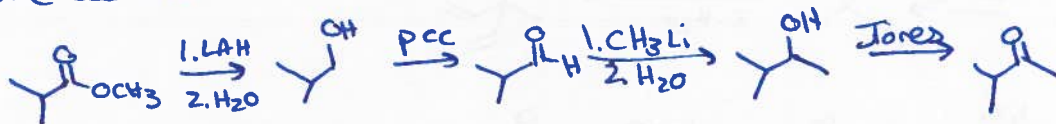
a) an acid base rxn occurs between acid +  $\text{CH}_3\text{Li}$



b)  $\text{C}_6\text{H}_5\text{MgBr}$  will deprotonate alcohol instead of attacking carbonyl



c) Ketones are more reactive than esters so rxn cannot be stopped at one addition



d) Grignard will attack its own alcohol hydrogen as soon as it is formed

