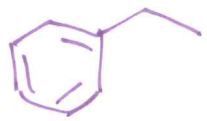
Name: _____ SB#: _____

*** This is to be done individually; see page 8 for details. ***

1 $Br_2/FeBr_3$

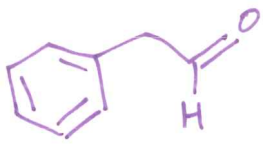
2 Mg, Et_2O

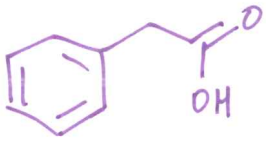
3 

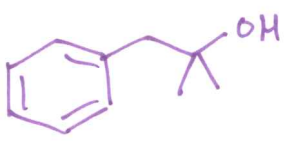
4 Br_2, $h\nu$

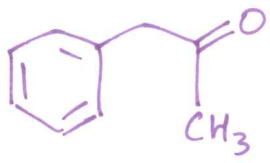
5 KO^tBu

6 1. $BH_3 \cdot THF$
2. H_2O_2, OH^-

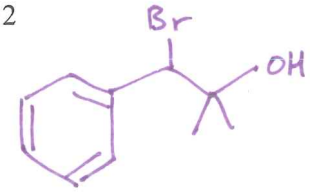
7 

8 

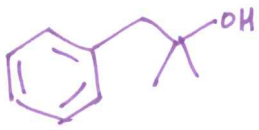
9 

10 

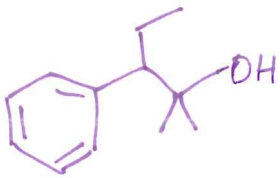
11 CH_2PPh_3

12 

13 KO^tBu

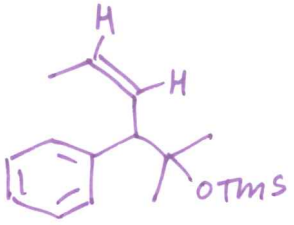
14 

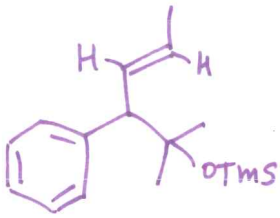
15 me_3SiCl, pyridine

16 

17 $CH_3C\equiv C^{\ominus}\ Li^{\oplus}$

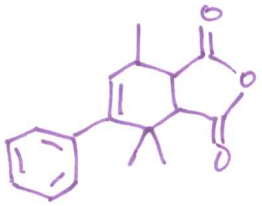
18 TMSCl, py

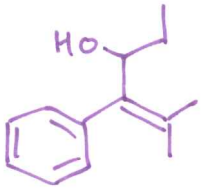
19 

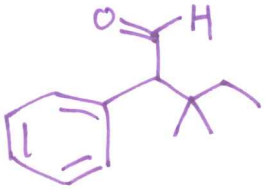
20 

21 $Bu_4N^{\oplus}\ F^{\ominus}$

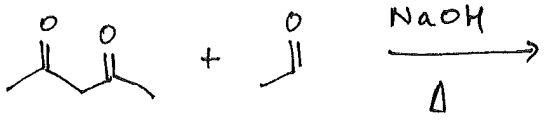
22 H_2SO_4

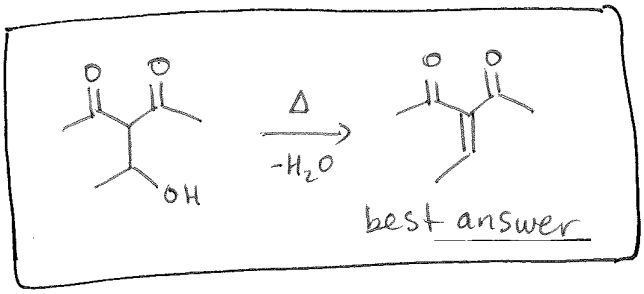
23 

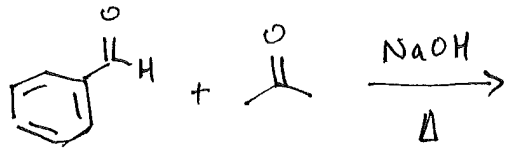
24 

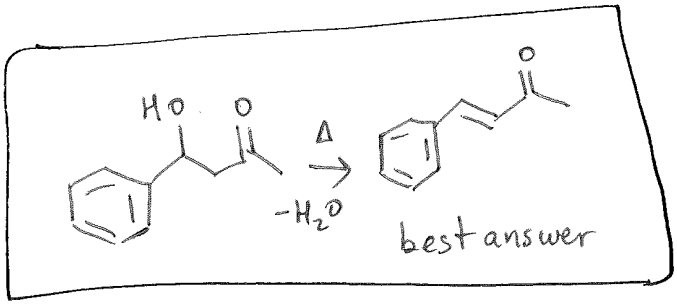
25 

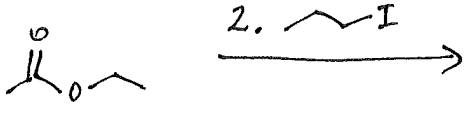
1. Please fill in the missing product(s).

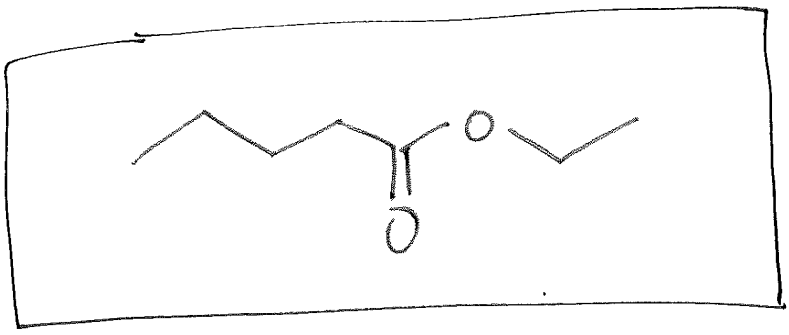
(a) 

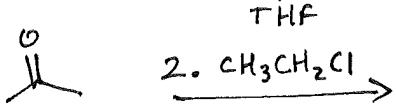


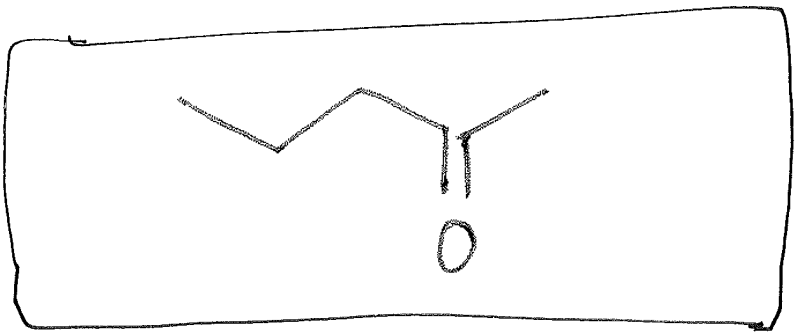
(b) 



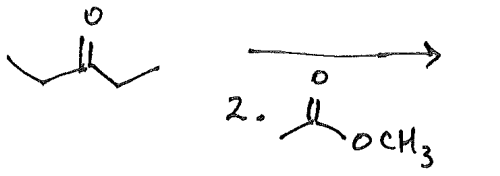
(c) 

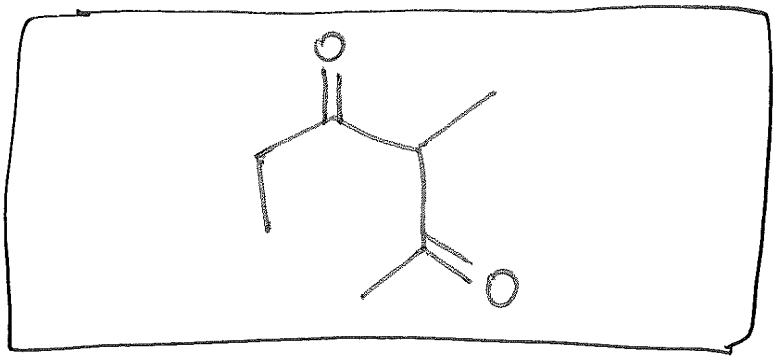


(d) 



1. (e)





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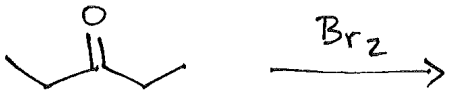
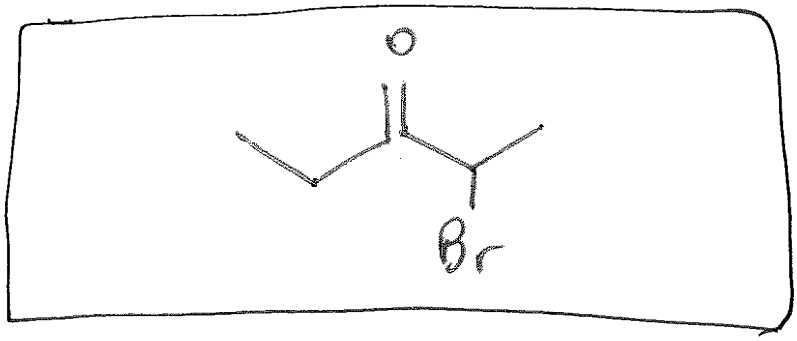
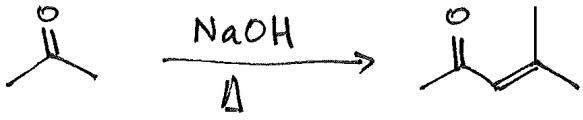
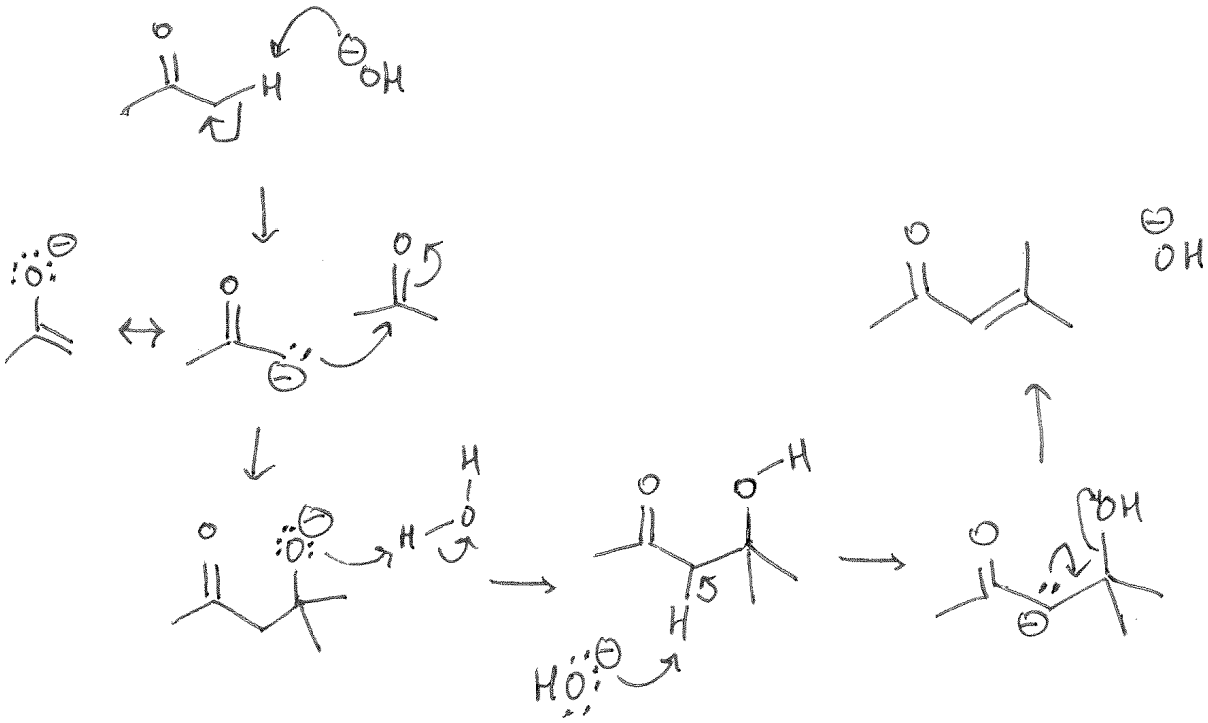
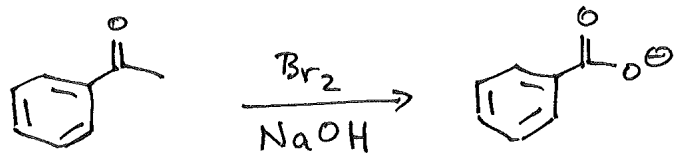


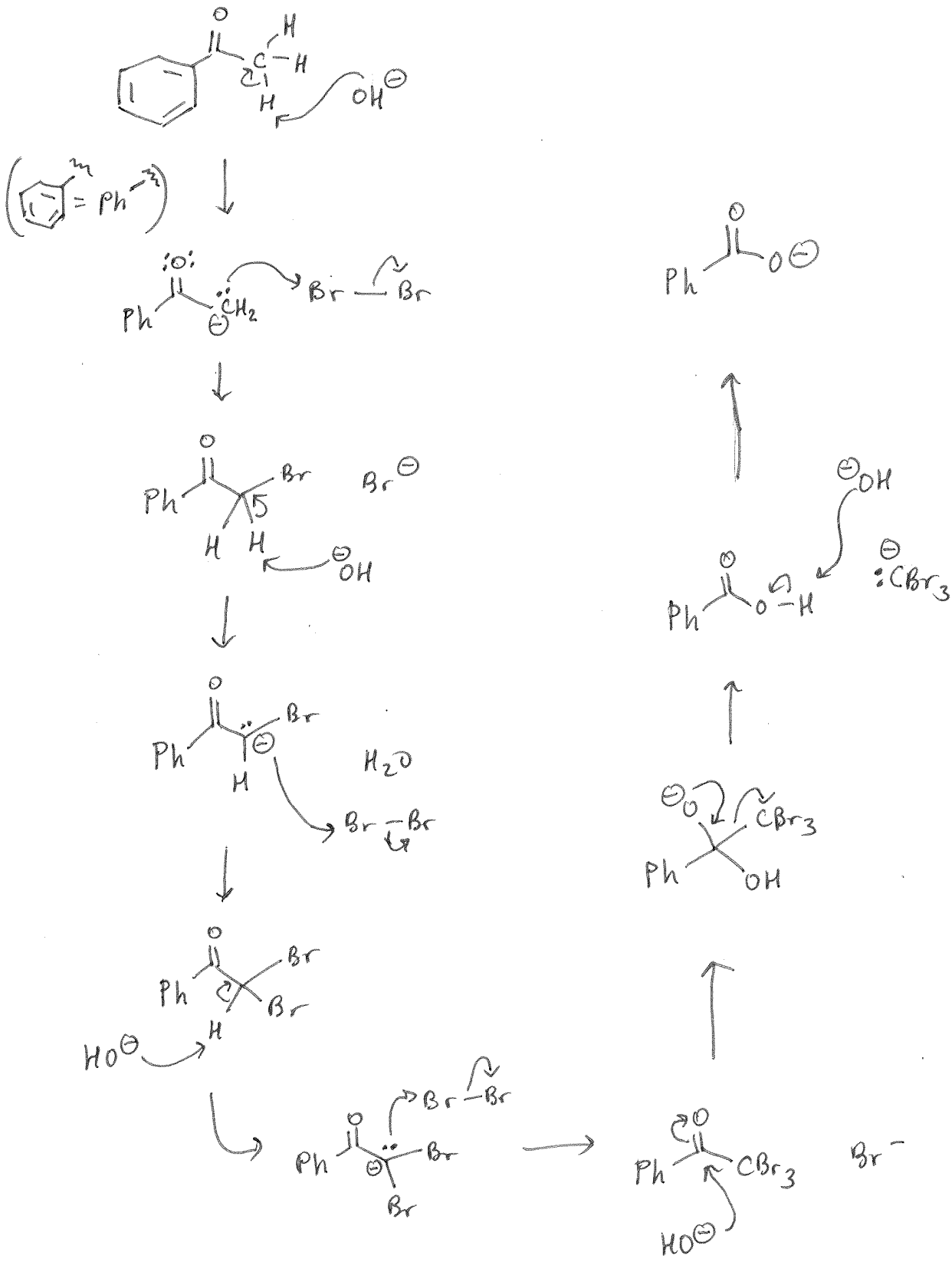


2. Write a mechanism for 



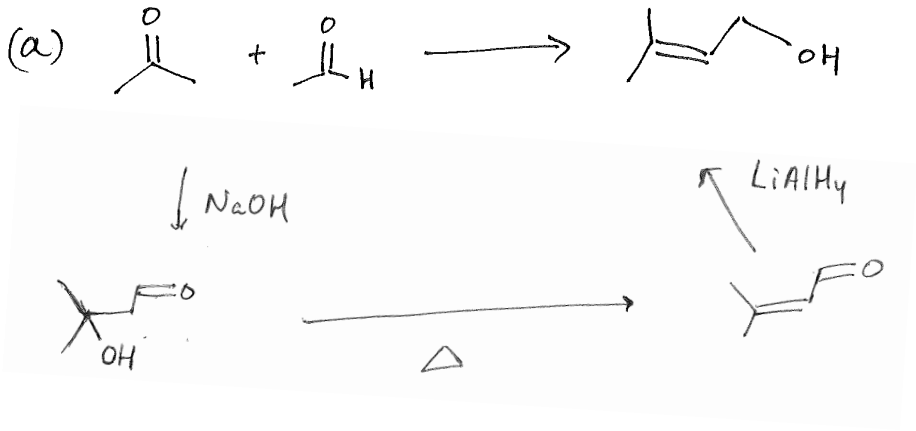
3. Write a mechanism for





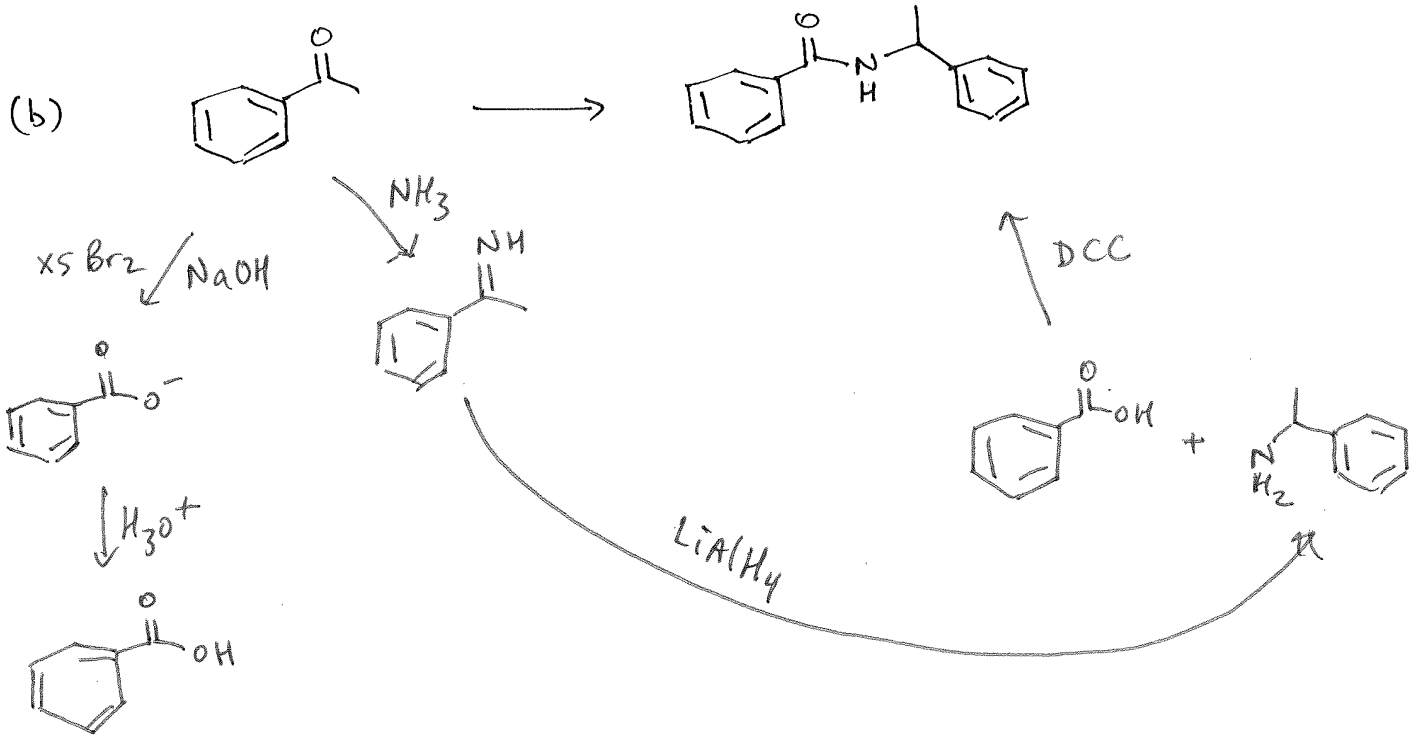
4. Write a series of reactions to accomplish the following reactions. All carbons in the product must come from the starting material. Draw all products/enantiomers at each step, if applicable, and circle the one used in the next step. These are synthesis problems, not mechanism problems.

(a)

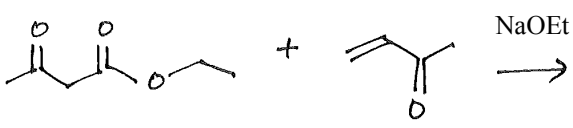


All students were given FULL CREDIT for problem 4.

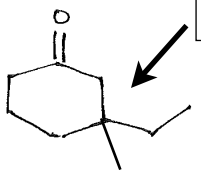
(b)

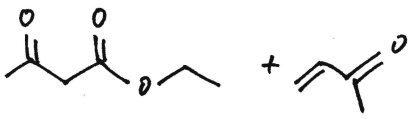


4. (c)



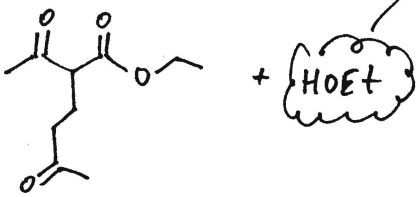
Please note, this was missing a methyl group



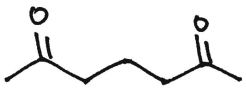


$\ominus OEt$

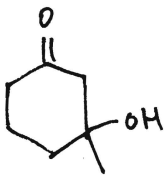
H_3O^+/H_2O



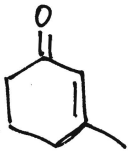
H_3O^+ and heat (hydrolysis and decarboxylation)



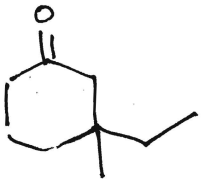
$NaOEt$



$NaOEt$, Δ



1. Et_2CuLi
2. H_3O^+/H_2O



$EtOH \xrightarrow{HBr} EtBr$

$\downarrow 2\,Li$

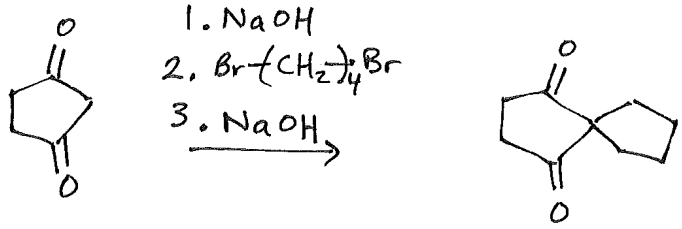
$EtLi + LiBr$

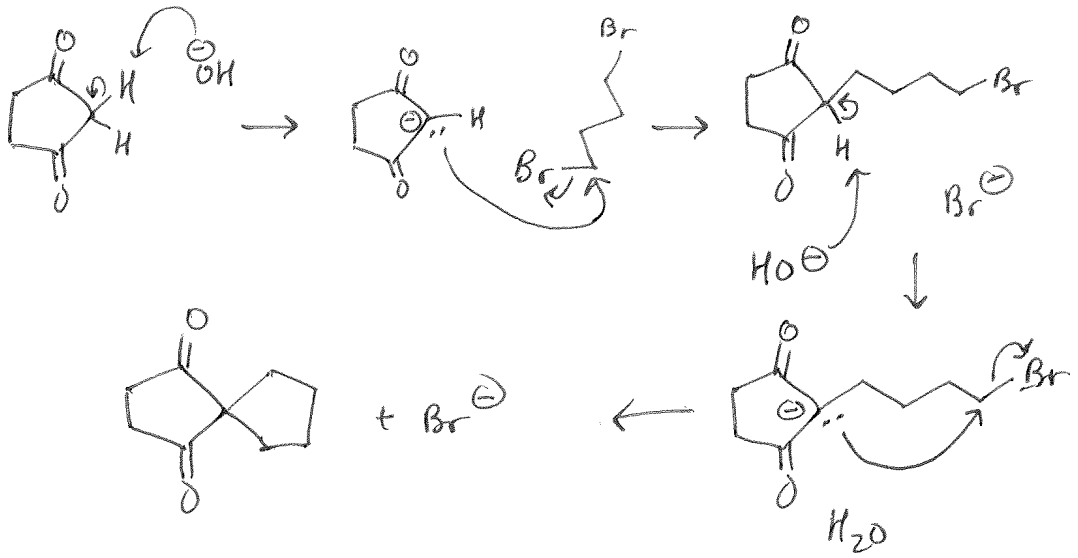
$\downarrow CuI$

Et_2CuLi

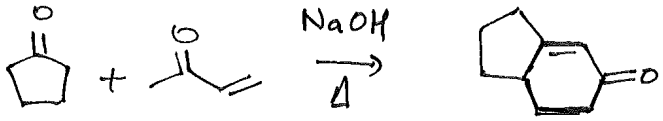
use down there

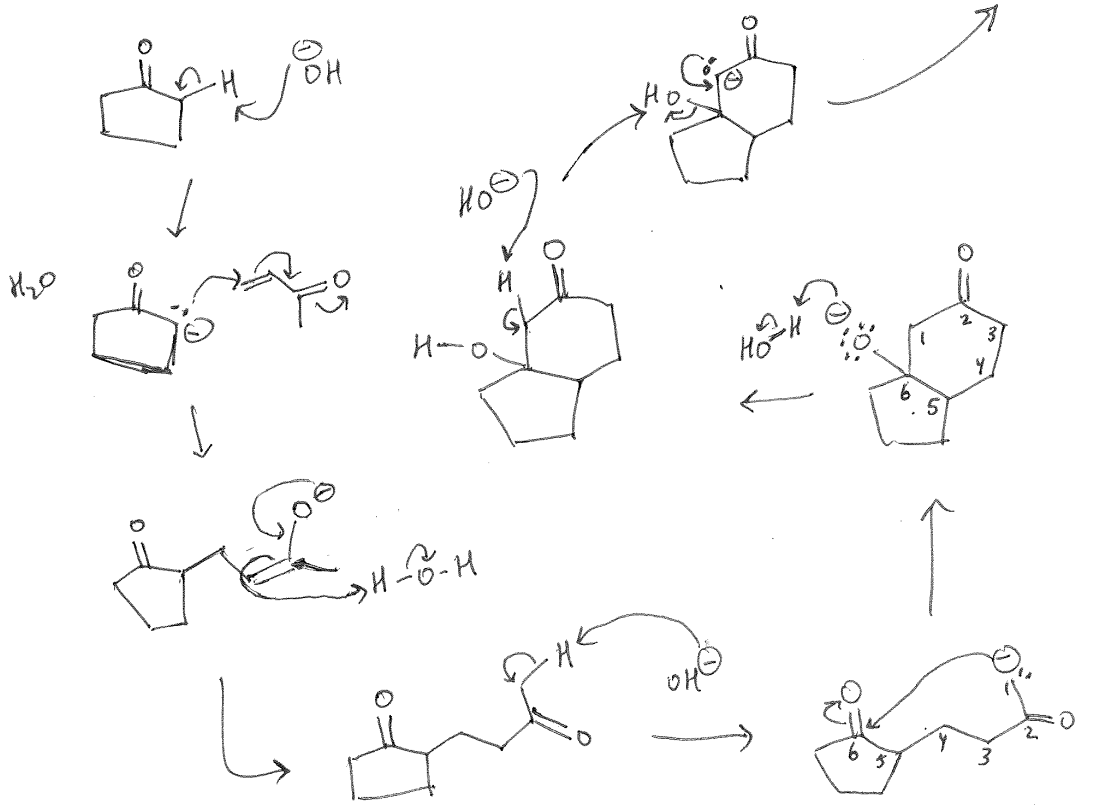
5. Write a mechanism for:





6. Write a mechanism for:

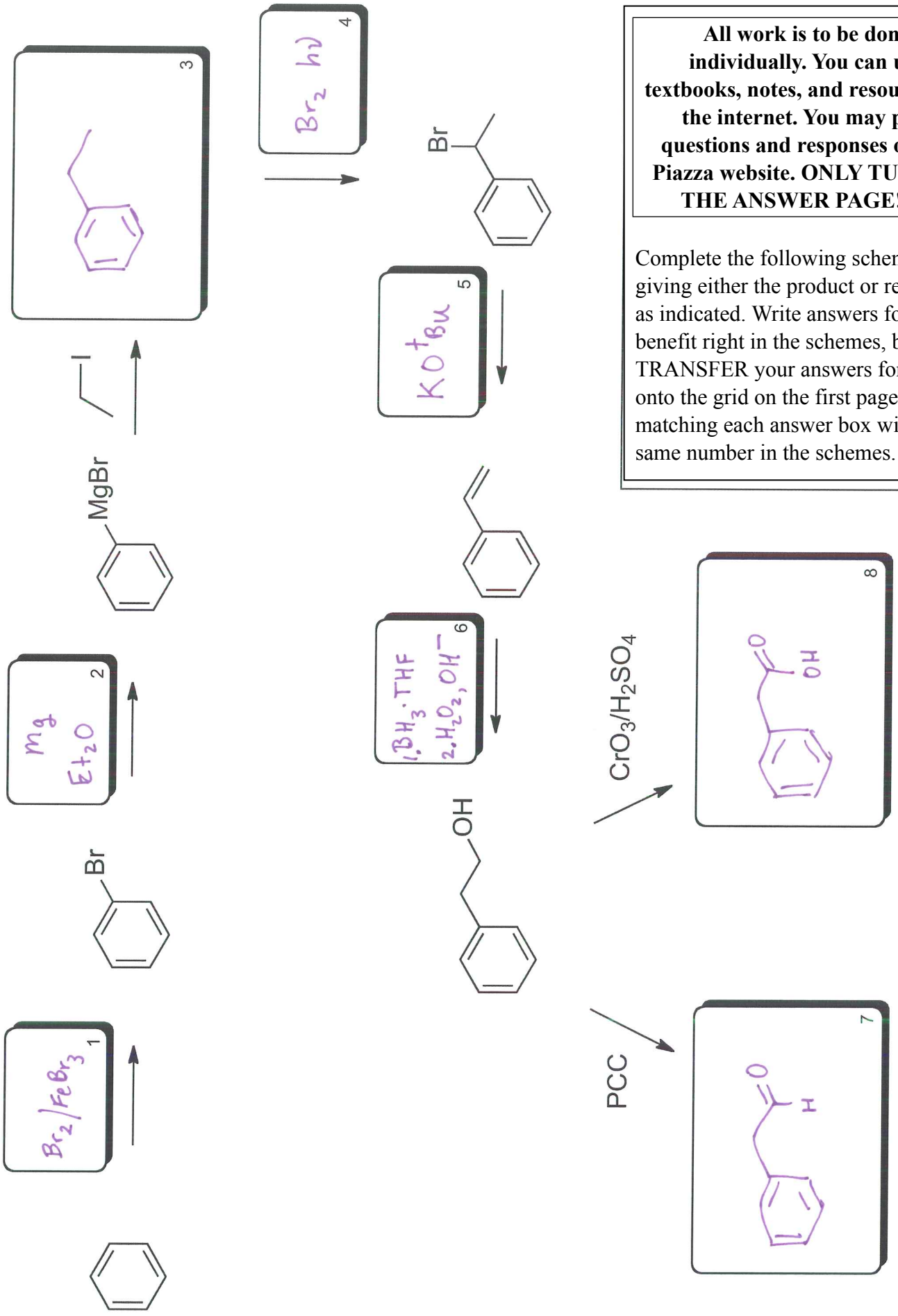


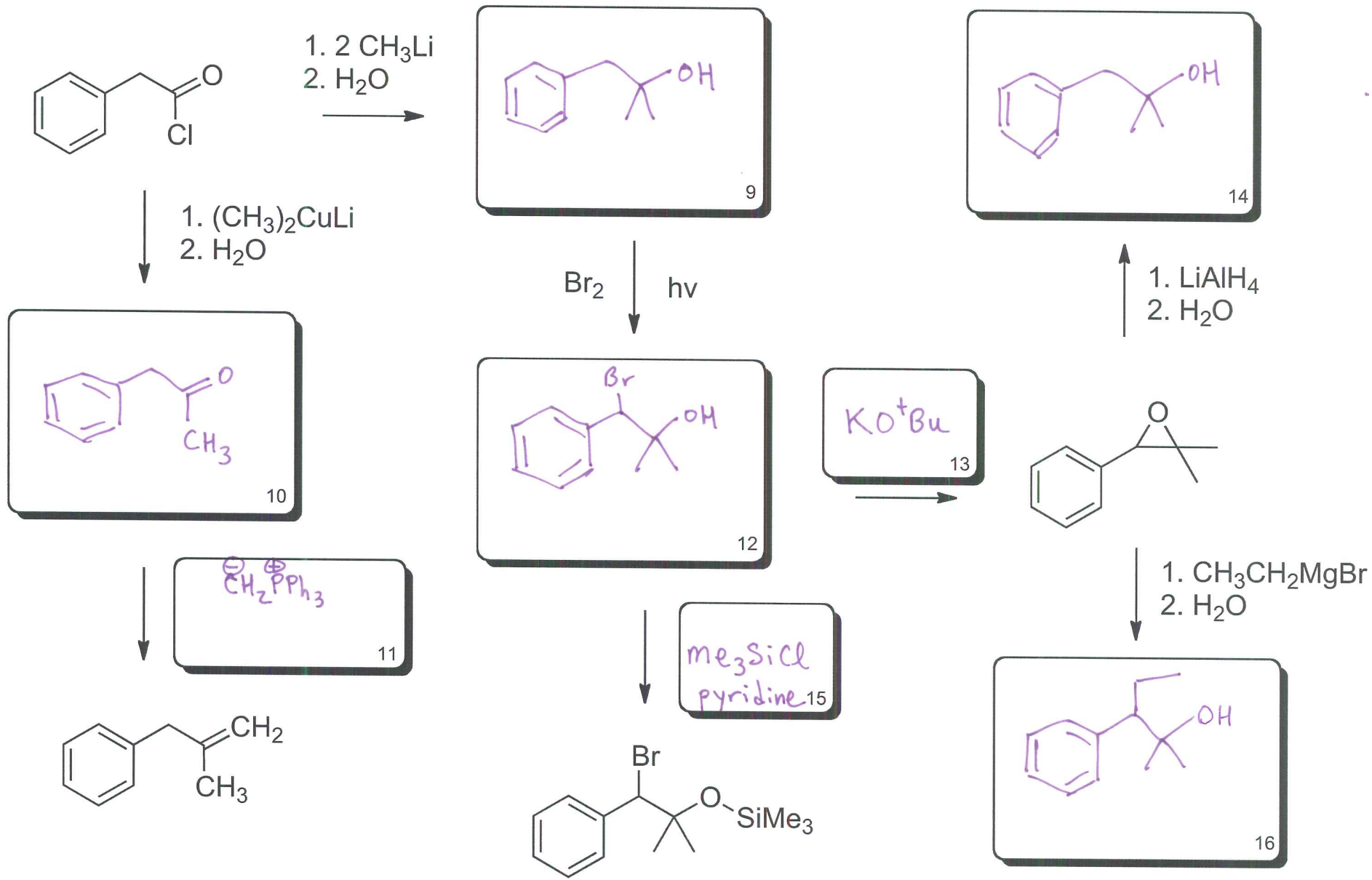


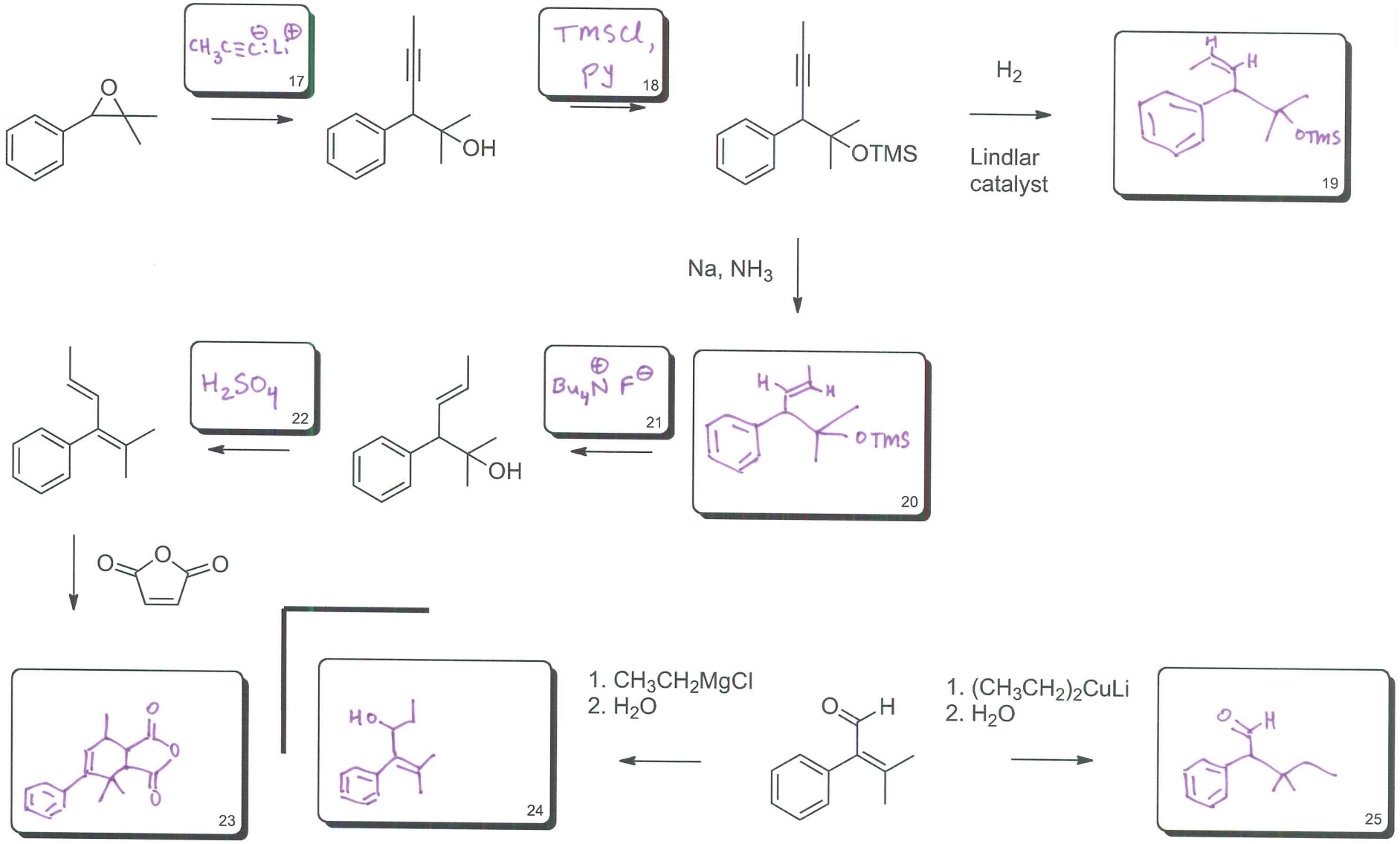
Solution Key

All work is to be done individually. You can use textbooks, notes, and resources on the internet. You may post questions and responses on the Piazza website. ONLY TURN IN THE ANSWER PAGE!!!!!

Complete the following schemes, giving either the product or reagent, as indicated. Write answers for your benefit right in the schemes, but TRANSFER your answers for grading onto the grid on the first page, matching each answer box with the same number in the schemes.




1. 2 CH3Li
2. H2O
1. (CH3)2CuLi
2. H2O
Br2
hv
1. LiAlH4
2. H2O
KO tBu
13
1. CH3CH2MgBr
2. H2O
Me3SiCl
pyridine
15
9
10
11
12
14
16
CH2
CH3
Br
O
SiMe3
OH


17
18
OH
TMSCl, Py
OTMS
H2
Lindlar catalyst
19
Na, NH3
20
21
22
H2SO4
23
24
1. CH3CH2MgCl
2. H2O
1. (CH3CH2)2CuLi
2. H2O
25