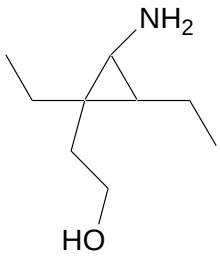
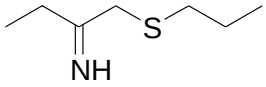
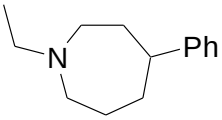
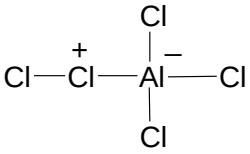
Mechanisms Final 200 points NAME:_____

1) (10pts) Draw all the lone pairs on the following chemical species.

a) 

b) 

c) 

d) 

2) (8pts) What is the hybridization of:

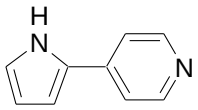
the Nitrogen in (a)

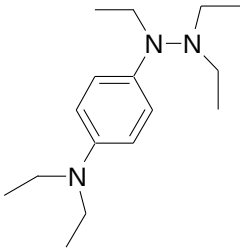
the Nitrogen in (b)

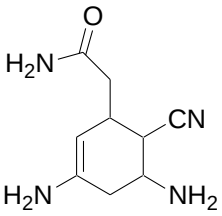
the Nitrogen in (c)

the left hand side Chlorine attached to the positive Chlorine in (d).

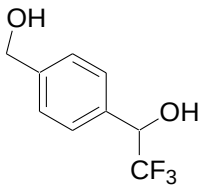
3) (9pts) Circle the most basic atoms in these molecules.

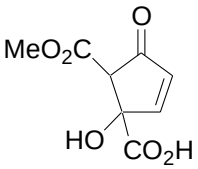


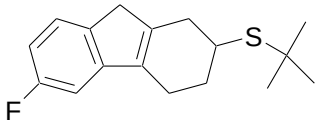


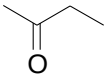


4) (8pts) Circle the most acidic hydrogens in these molecules.

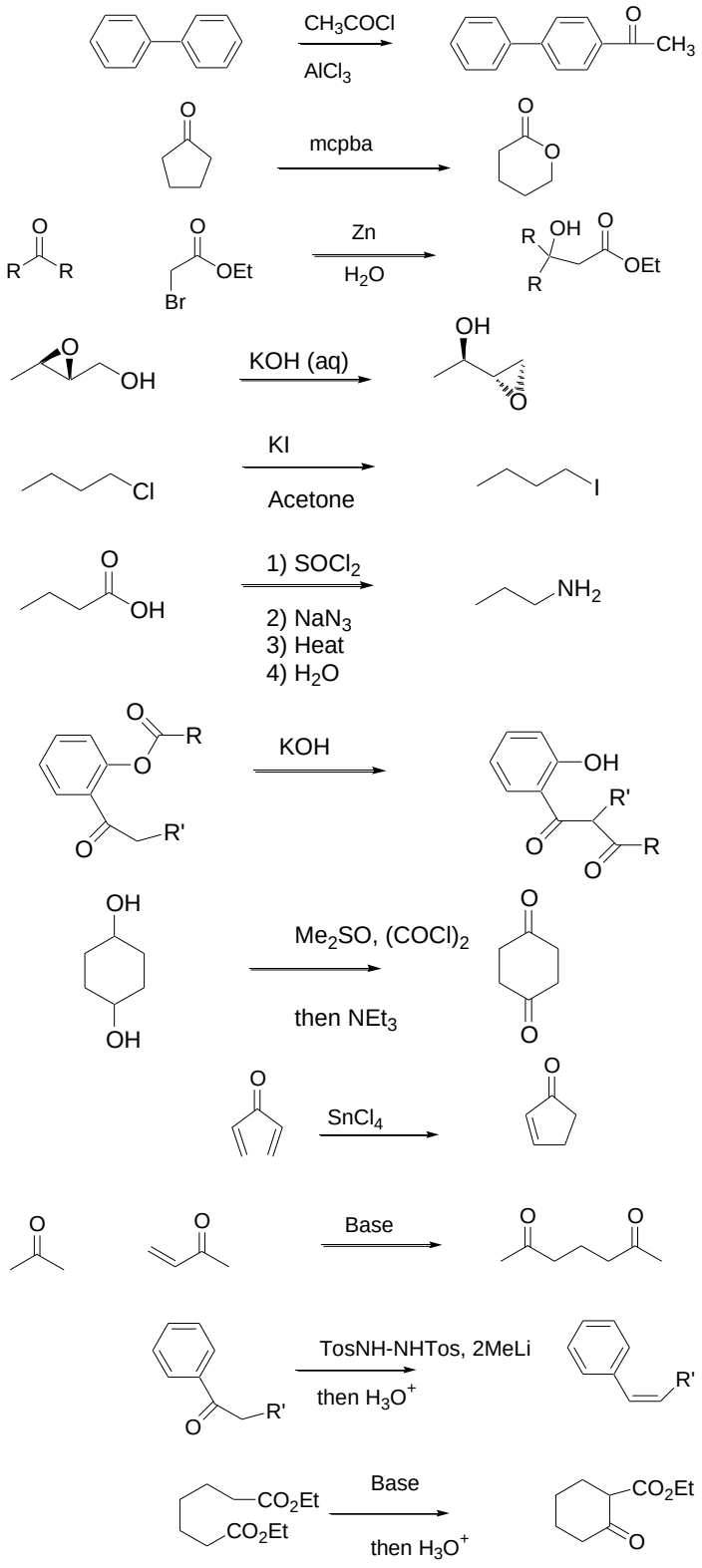








5) (24pts) Match these 12 transformations up with their correct name.



Hoffman Rearrangement

Finkelstein Reaction

Diels Alder Reaction

Wittig Reaction

Baker-Venkataraman Rearrangement

Heck Reaction

Nazarov Cyclization

Swern Oxidation

Bayer-Villiger Oxidn

Curtius Rearrangement

Payne Rearrangement

Henry Reaction

Benzoin Condensation

Michael Addition

Reformatsky Reaction

Friedal Crafts Acylation

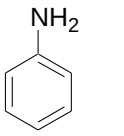
Shapiro Reaction

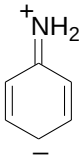
Dieckmann Condensation

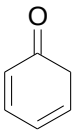
Hooker Reaction

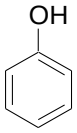
Danishevsky diene reaction

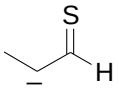
6) (6pts) Are the following pairs *tautomers* or *resonance structures*?

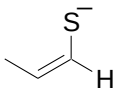


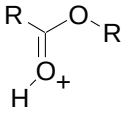


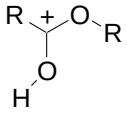








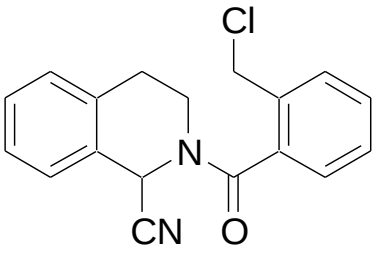




7) (10pts) Draw arrows to the correct locations.

Most Acidic C-H bond

Amide functional group *an sp hybridized atom*



the shortest bond in this molecule *site of potential S_N2 reaction*

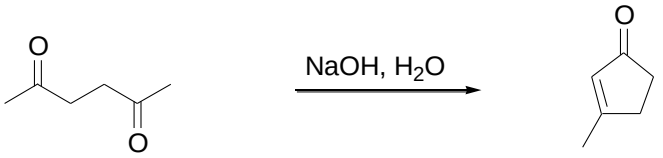
THE NEXT SECTION HAS 6 PROBLEMS

(A) – (F)

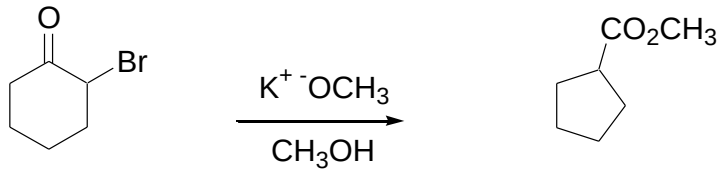
EACH WORTH 25 PTS

ANSWER ANY 5
(For 125 pts)

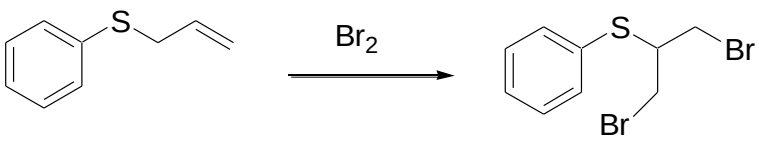
A) (25pts) Write the mechanism for the following reaction (which involves anion formation at a methyl group, ring closure, and dehydration). Note that the reaction is in basic media.



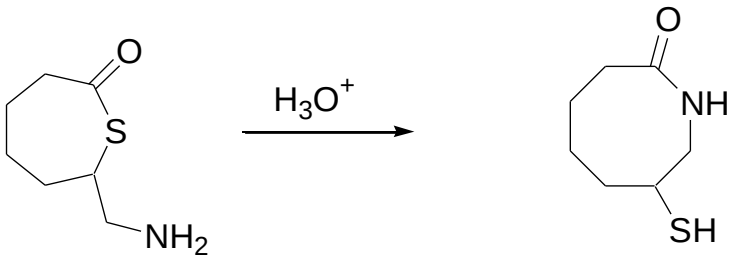
B) (25pts) The Favorskii Reaction involves ring contraction of a cyclic α-bromoketone. Write the mechanism for this transformation, and recall it proceeds through a cyclopropanone intermediate.



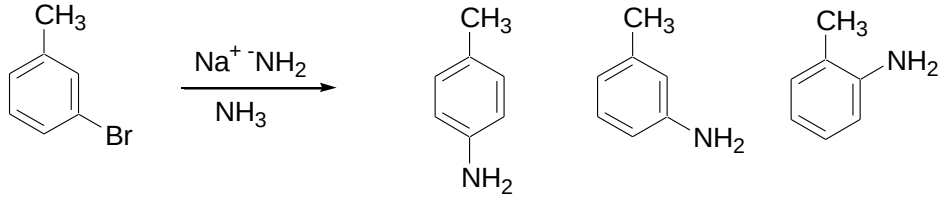
C) (25pts) Write the mechanism for this reaction that obviously involves a rearrangement.



D) (25pts) Write the correct acid catalyzed mechanism for this rearrangement.



E) (25pts) Explain the mixture of products obtained in the following reaction, and indicate the expected relative ratio of the products formed – ***hint*** it is NOT 1:1:1.



F) (25pts) Pick any **two** of the reactions listed in Q5 and write correct mechanisms for both.

Mechanisms Final 200 points NAME:_____

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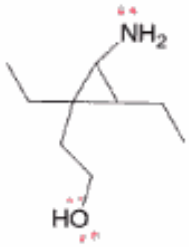
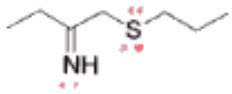
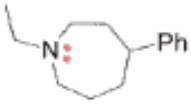
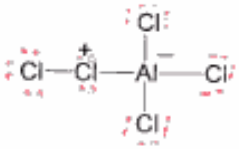
a) 

b) 

c) 

d) 

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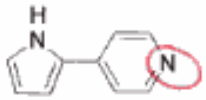

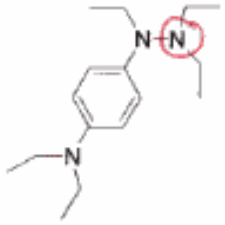

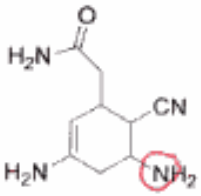

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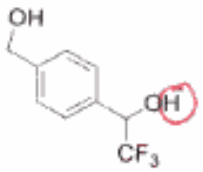

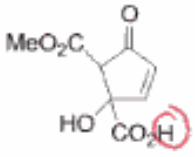

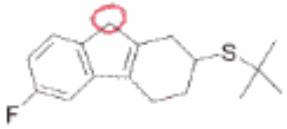

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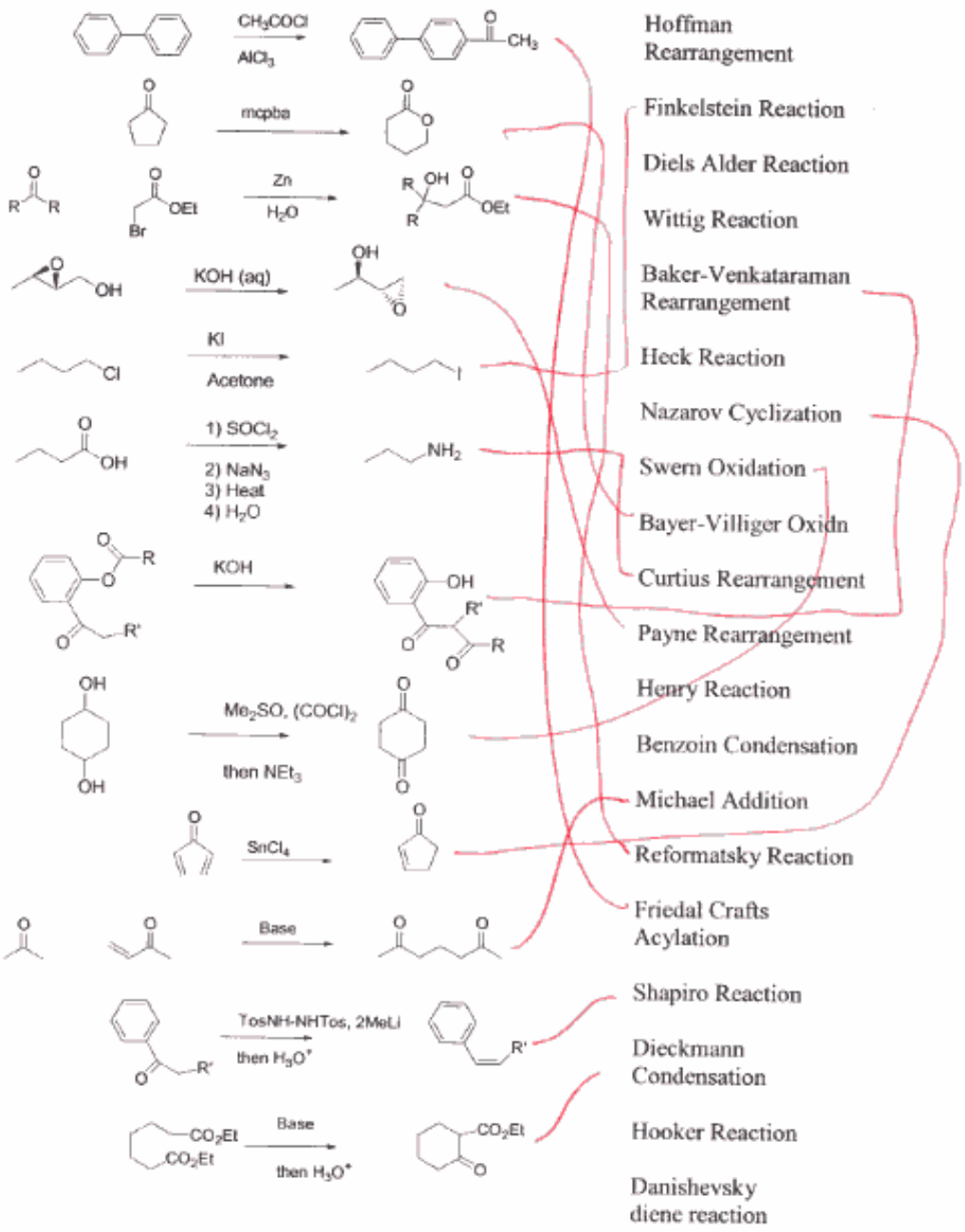

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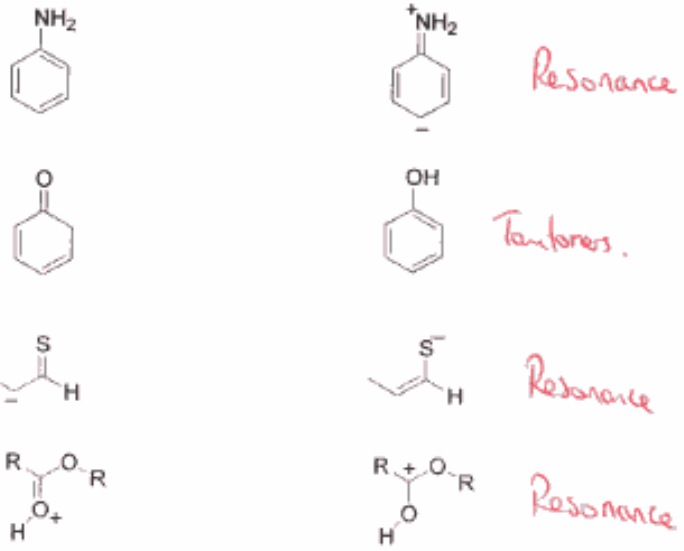

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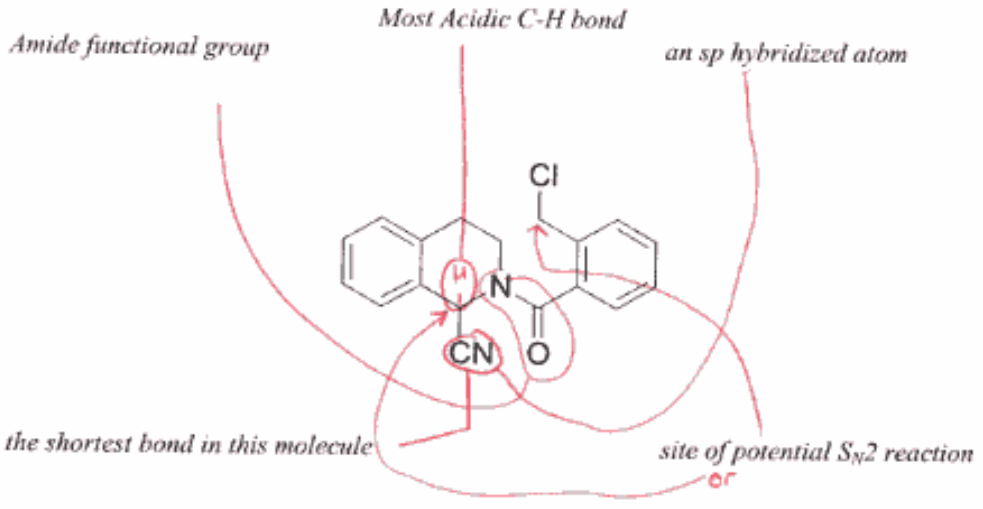

THE NEXT SECTION HAS 6 PROBLEMS

(A) – (F)

EACH WORTH 25 PTS

ANSWER ANY 5
(For 125 pts)

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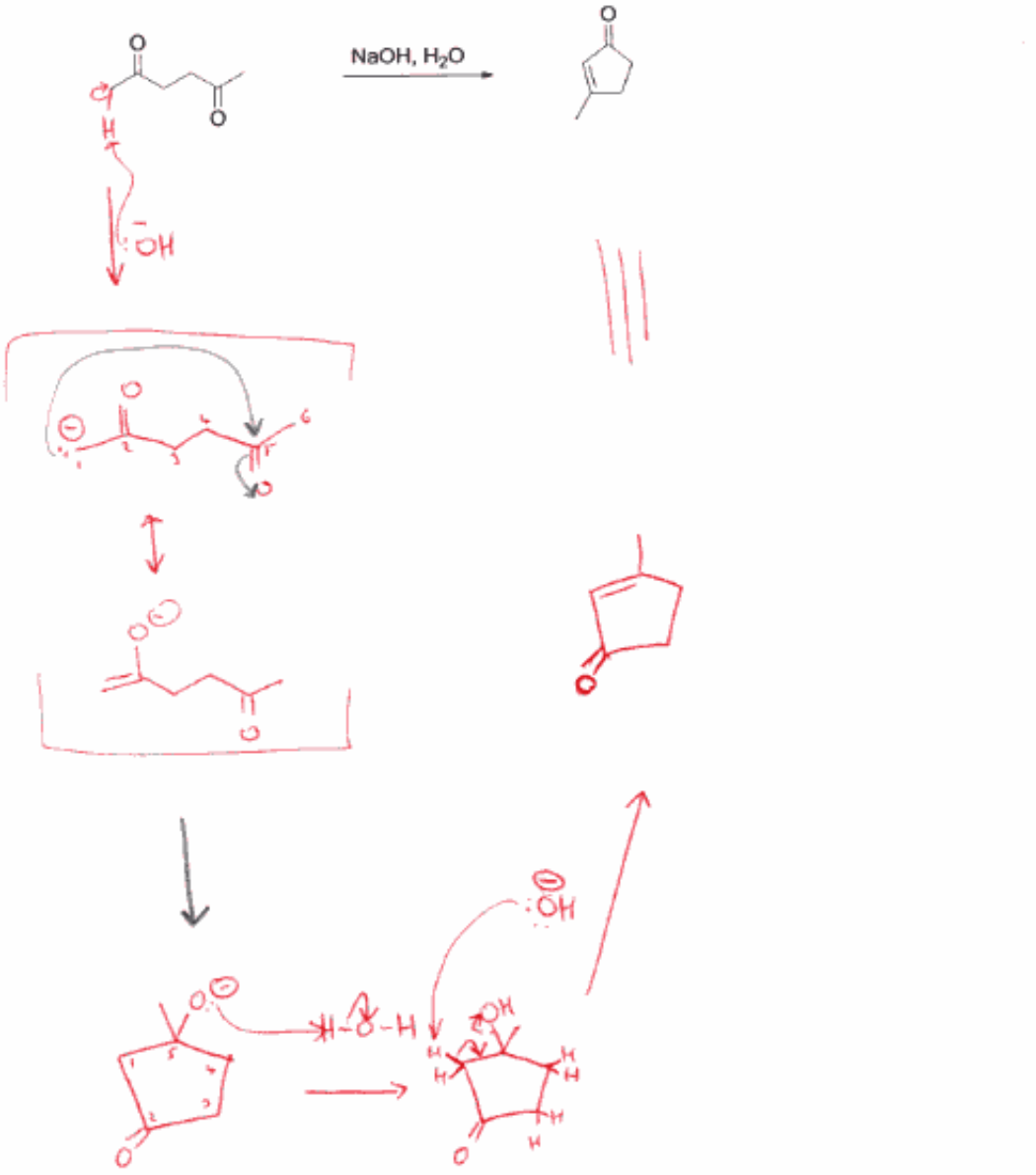

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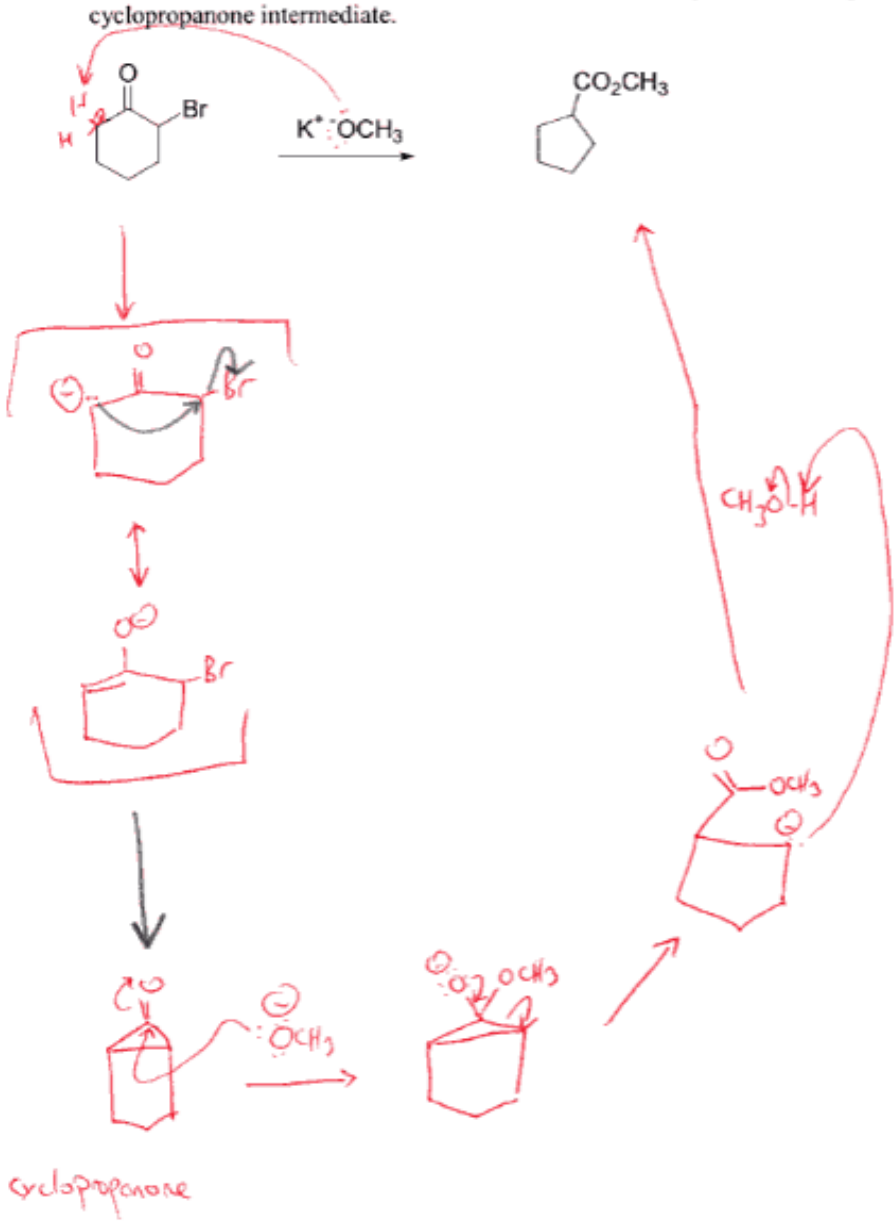

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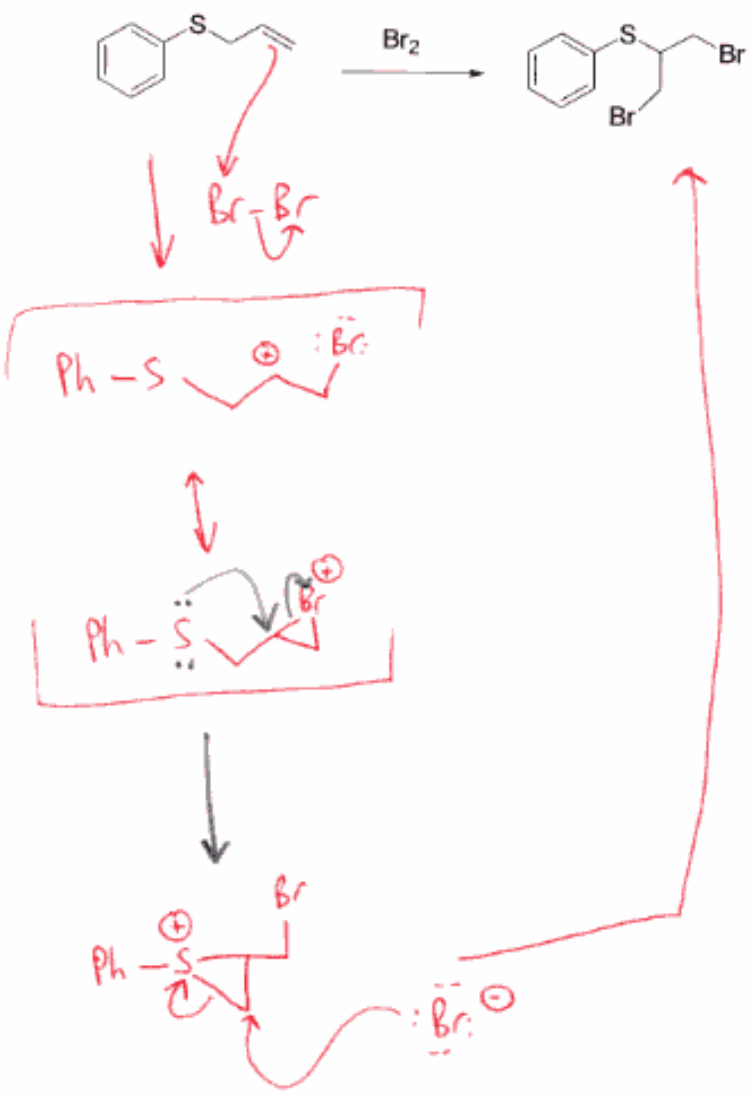

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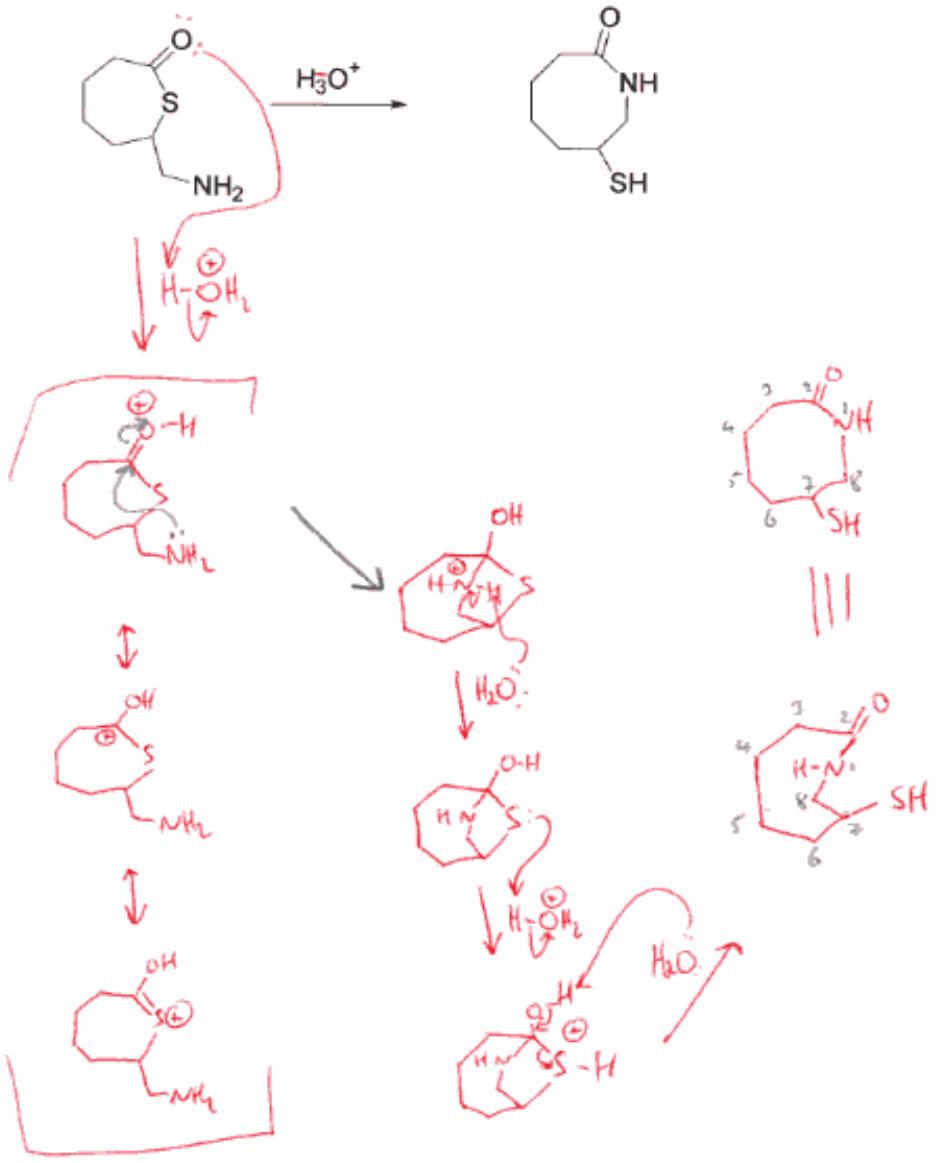

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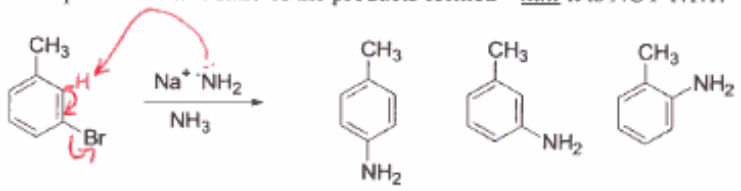
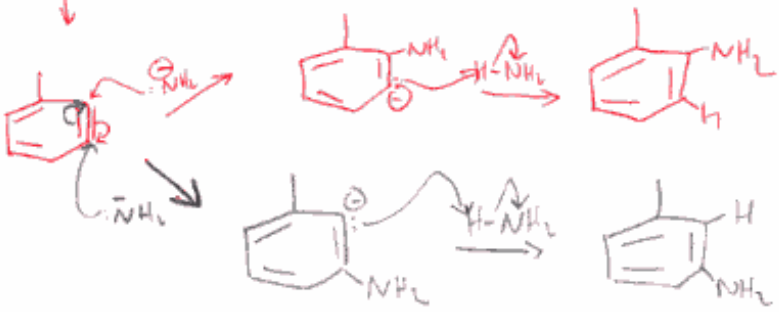
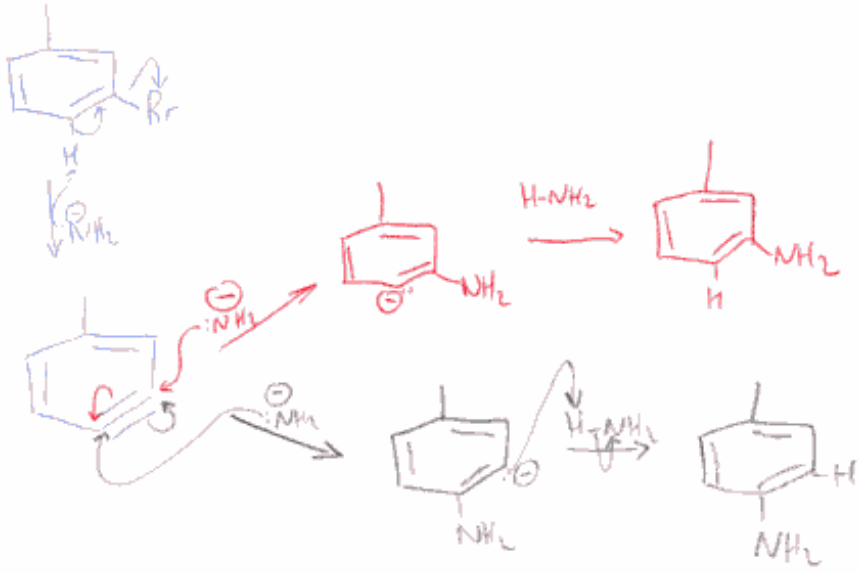


1 : 2 : 1 Ratio



But also



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Check Your Hand outs from the talks!!