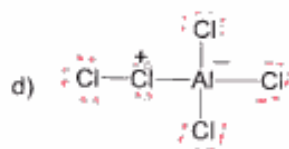
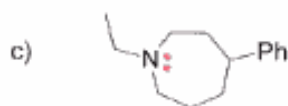
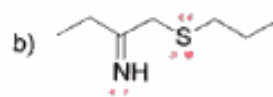
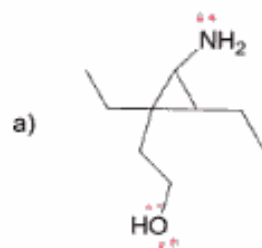


1) (10pts) Draw all the lone pairs on the following chemical species.



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

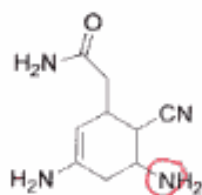
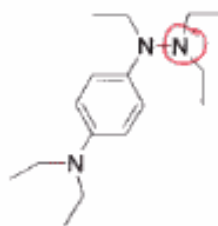
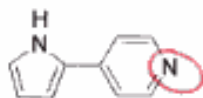
the Nitrogen in (a) sp^3

the Nitrogen in (b) sp^2

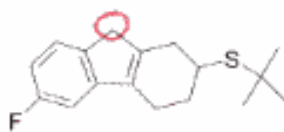
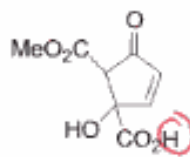
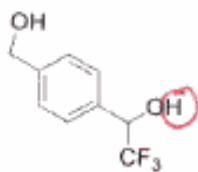
the Nitrogen in (c) sp^3

the left hand side Chlorine attached to the positive Chlorine in (d). sp^3

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



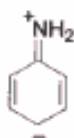
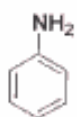
4) (8pts) Circle the most acidic hydrogens in these molecules.



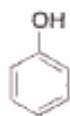
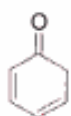
5) (24pts) Match these 12 transformations up with their correct name.

	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

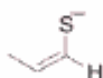
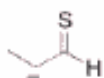
6) (6pts) Are the following pairs *tautomers* or *resonance structures*?



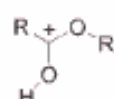
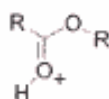
Resonance



Tautomers.

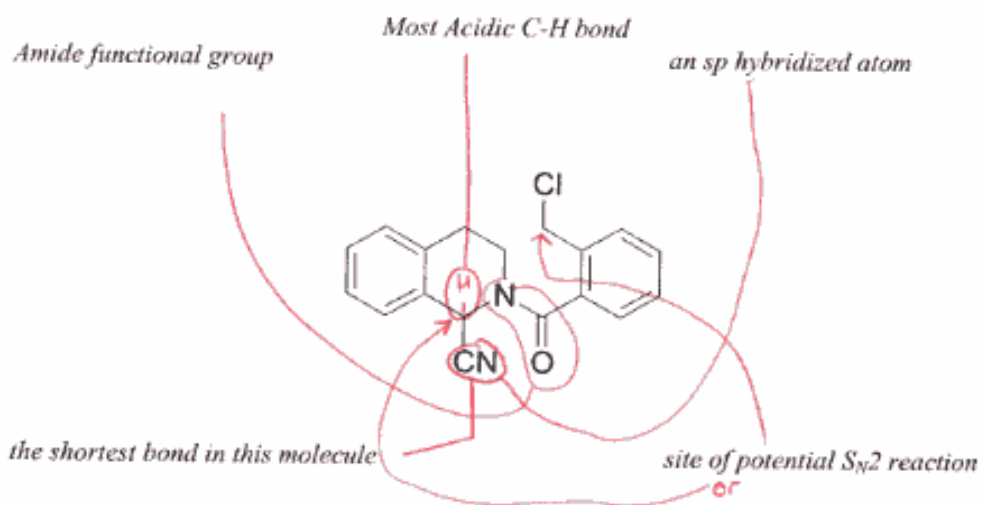


Resonance



Resonance

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



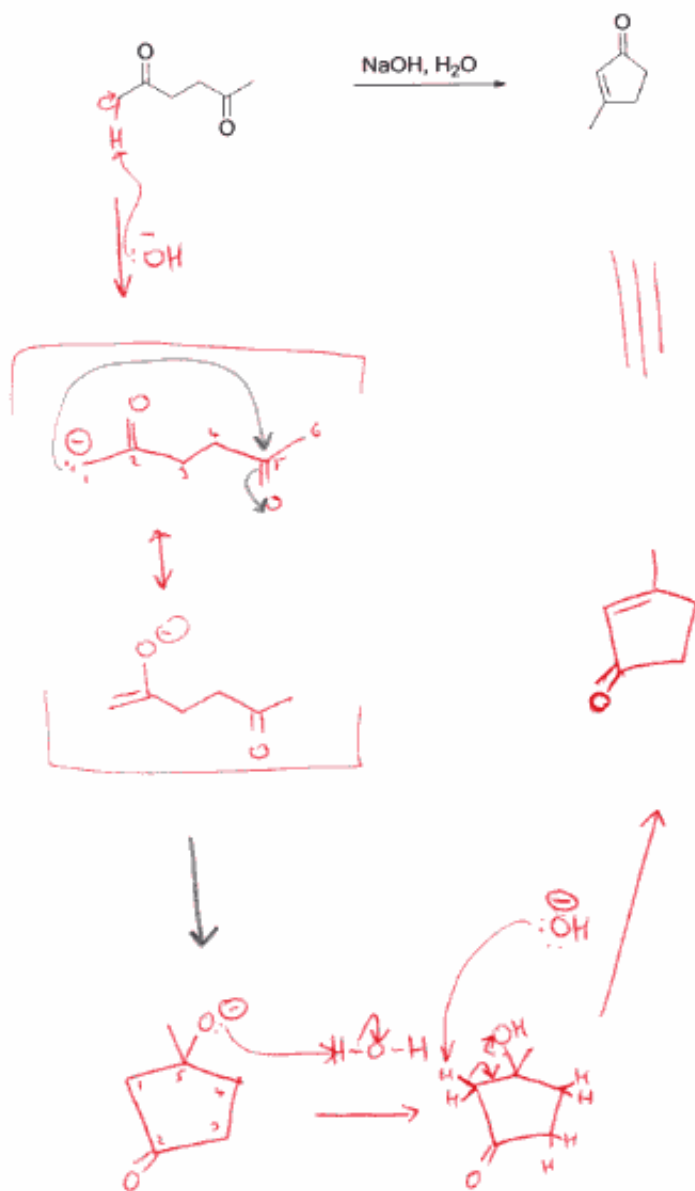
THE NEXT SECTION HAS 6 PROBLEMS

(A) – (F)

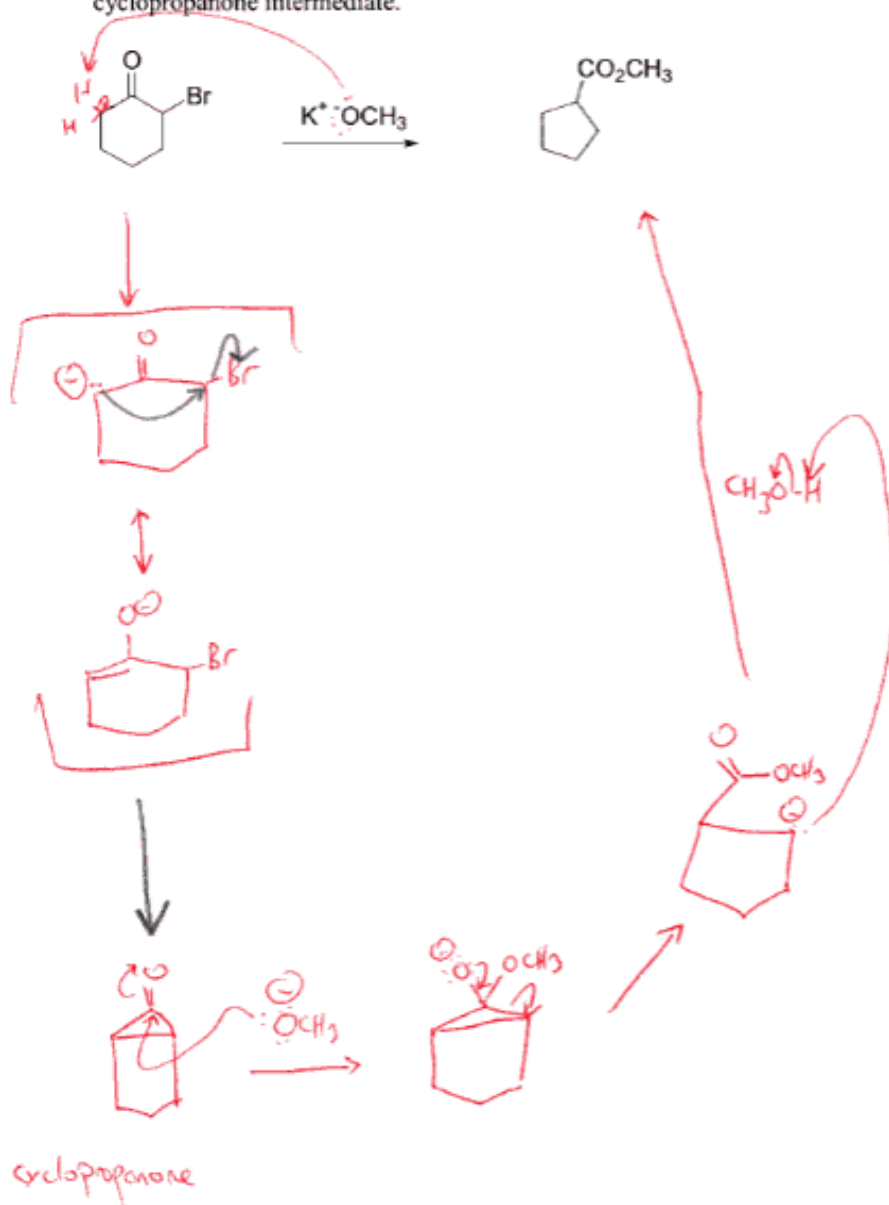
EACH WORTH 25 PTS

ANSWER ANY 5
(For 125 pts)

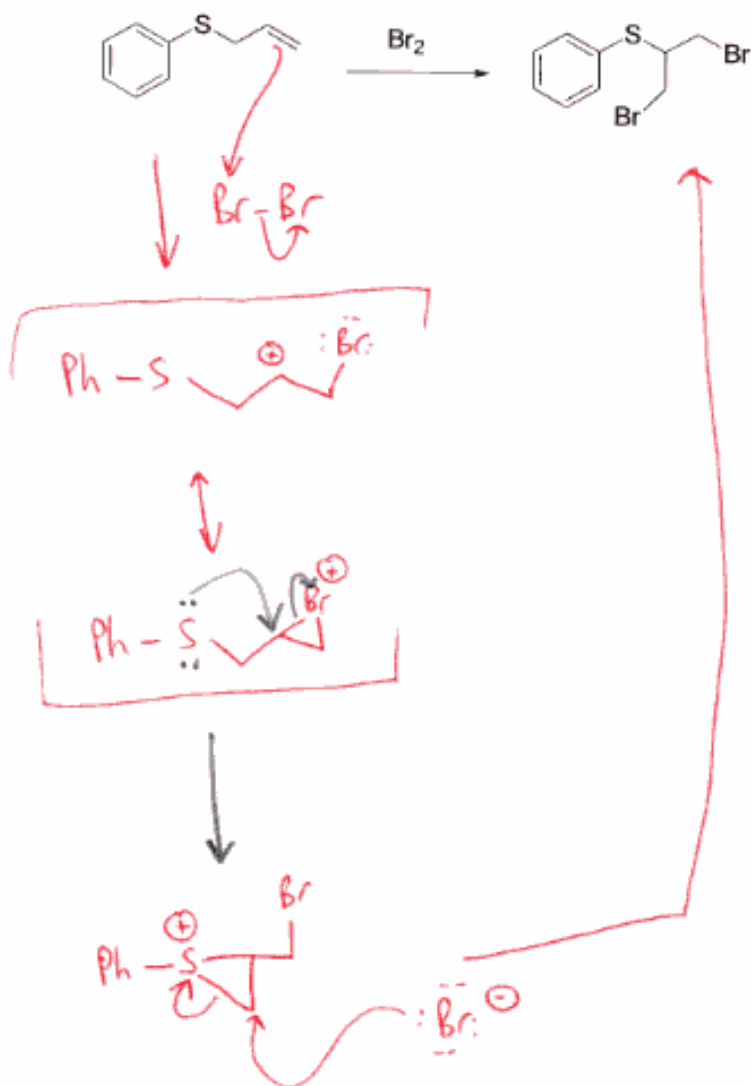
A) (25pts) Write the mechanism for the following reaction (which involves anion formation at a methyl group, ring closure, and dehydration). Note that the reaction is in basic media.



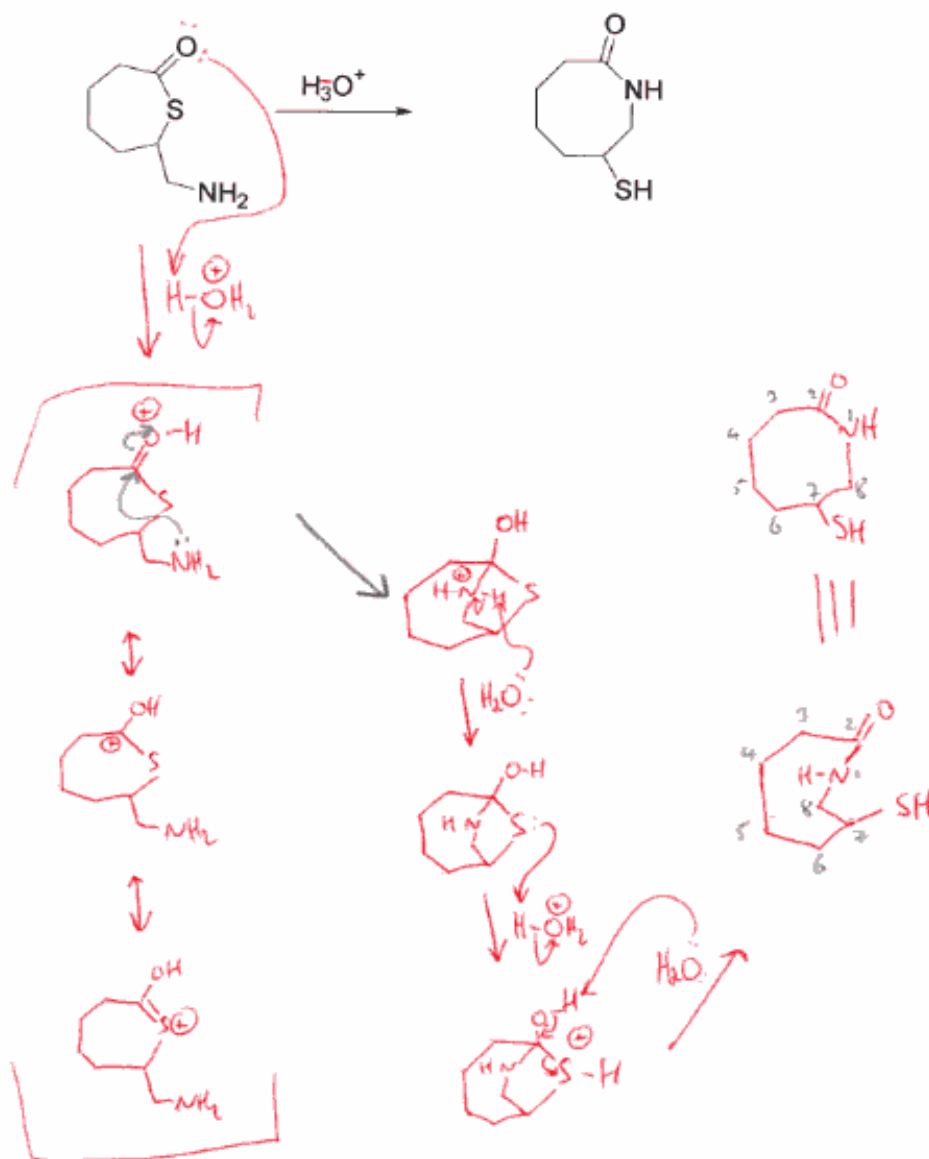
B) (25pts) The Favorskii Reaction involves ring contraction of a cyclic α -bromoketone. Write the mechanism for this transformation, and recall it proceeds through a cyclopropanone intermediate.



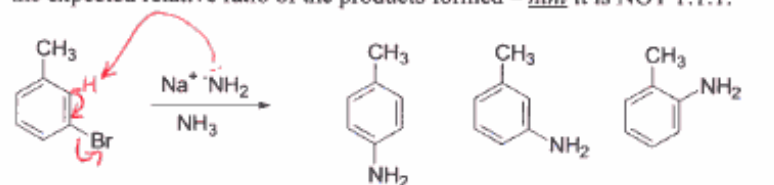
C) (25pts) Write the mechanism for this reaction that obviously involves a rearrangement.



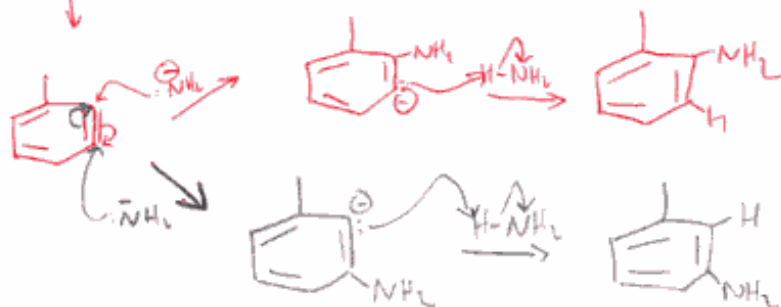
D) (25pts) Write the correct acid catalyzed mechanism for this rearrangement.



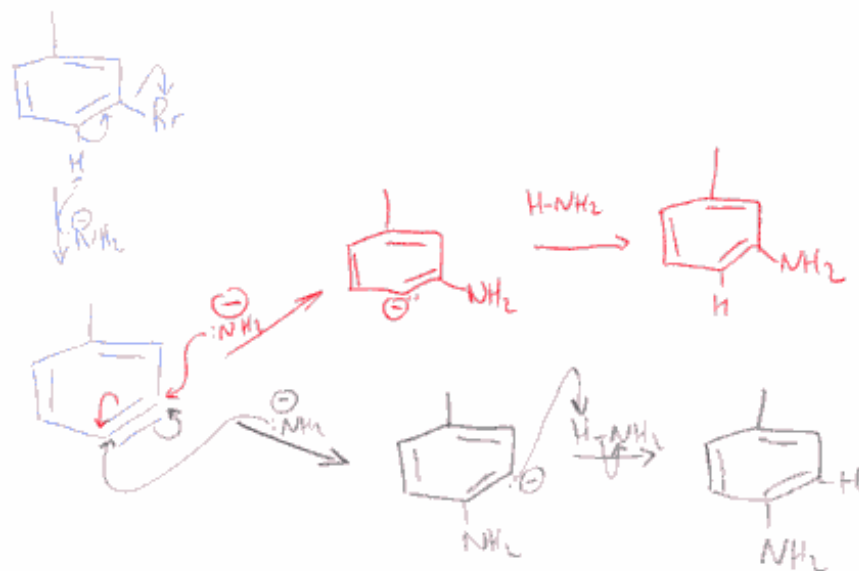
E) (25pts) Explain the mixture of products obtained in the following reaction, and indicate the expected relative ratio of the products formed - *hint* it is NOT 1:1:1.



1 : 2 : 1 Ratio



But also



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

Check Your Handouts from the talks!!