

Part I

(3 pts) Write out the correct structure for the following IUPAC name. Remember to specify stereochemistry clearly.

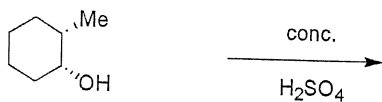
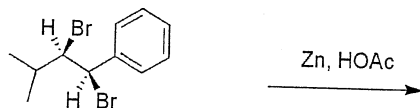
7*S*-iodo-(3*E*,5*Z*)-nonadiene

(3 pts each) Each of the following names is incorrect. State the reason the given name is incorrect, and then give the correct IUPAC name.

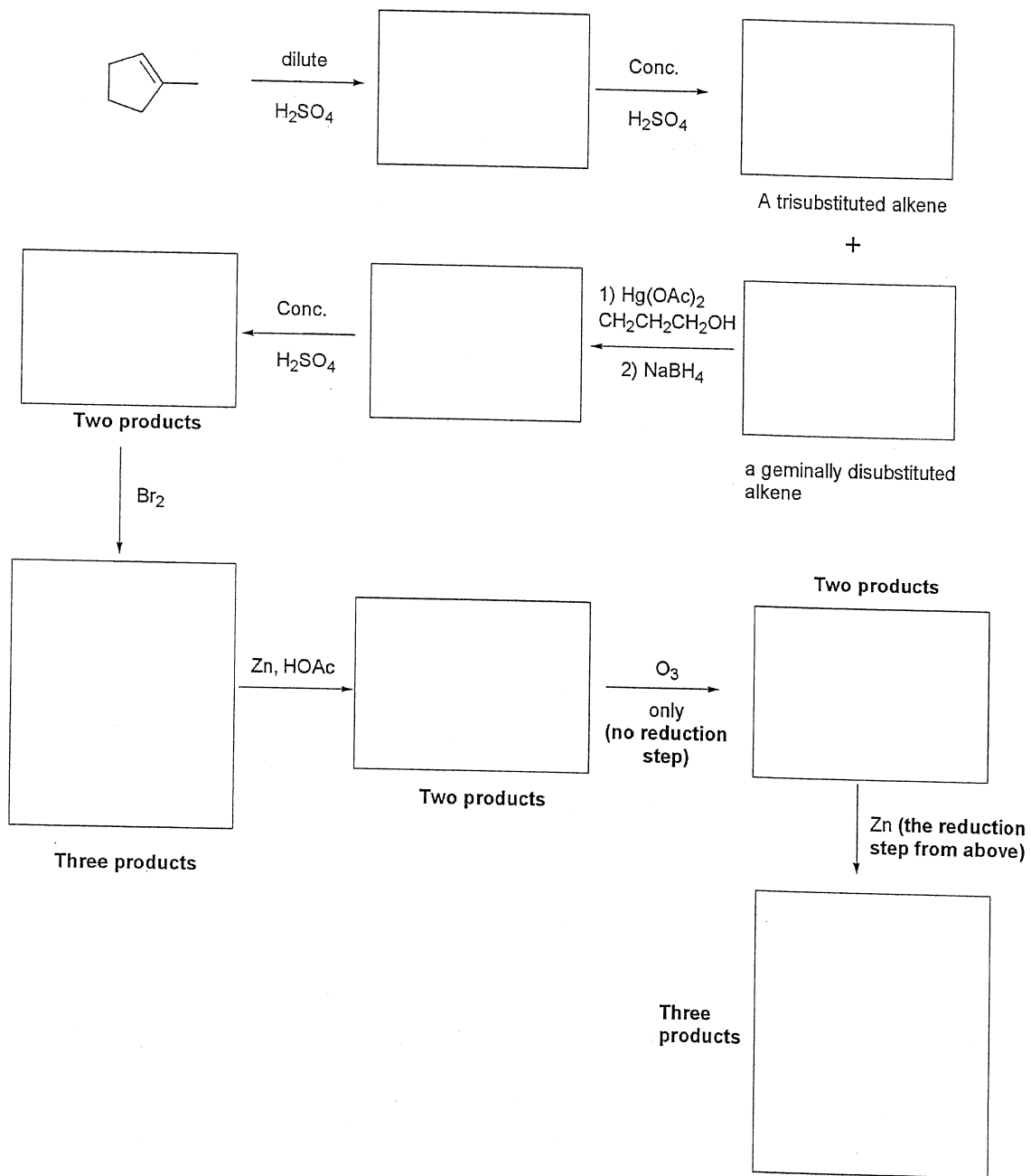
(*E*)-1-isopropyl-1-pentene

(*Z*)-2-methyl-2-butene

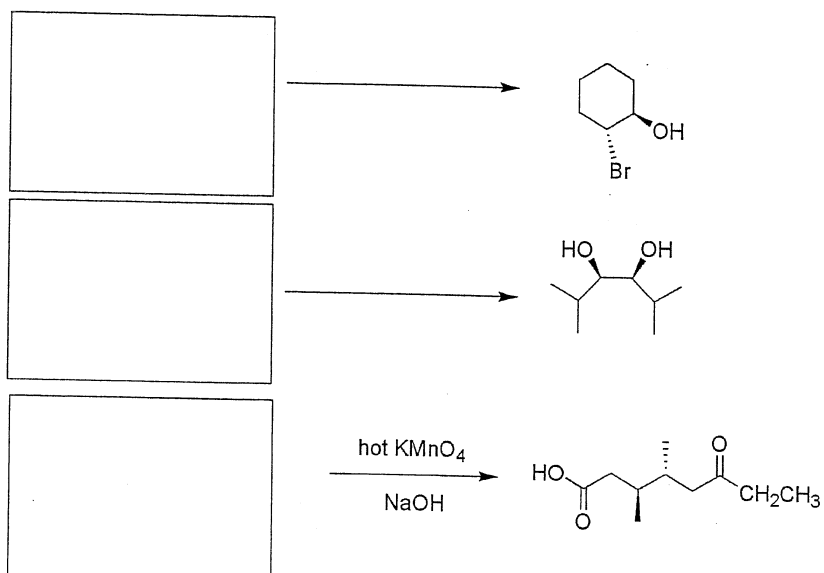
(4 pts each) Predict **all** products that arise from the following reactions. State which alkene products are major and which are minor.



(3 pts each) The following is a reaction "cascade." Provide the intermediate products in the boxes. Remember to specify stereochemistry with "wedges and dashes." Multiple products may go in a single box.



(3 pts each) Provide the reagents and/or starting materials required to synthesize the following compounds:

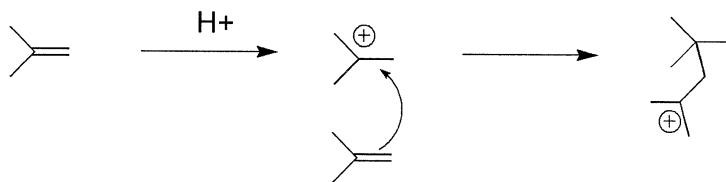


(12 pts) Provide a detailed mechanism, using "curved arrow formalism," for the following reaction. **Show the formation of all possible products.** Remember to specify stereochemistry where appropriate:

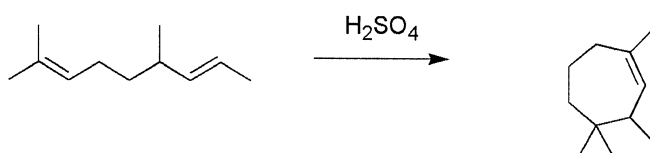
**The oxymercuration/demercuration of 3-*R*-hydroxy-5-methyl-(5*E*)-heptene**

## Part II (EXTRA CREDIT!!!)

(9 pts) Like other electrophiles, alkenes can add to carbocations to form new carbocations, which can then undergo substitution or elimination, depending on reaction conditions.



With this in mind, let's develop a stepwise mechanism for the following reaction:



1) When the starting material is submitted to acid, which carbocation will preferentially form? Draw it.

2) The other double bond (the one that doesn't form the most stable carbocation) must then be the nucleophile. Draw its attack on the carbocation formed in step 1) and show formation of the new carbocation.

3) The final product is an alkene, which must arise from an E1 (elimination) reaction from the carbocation formed in step 2). Draw the final elimination step.

Part I

(3 pts) Write out the correct structure for the following IUPAC name. Remember to specify stereochemistry clearly.

7*S*-iodo-(3*E*,5*Z*)-nonadiene



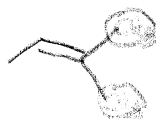
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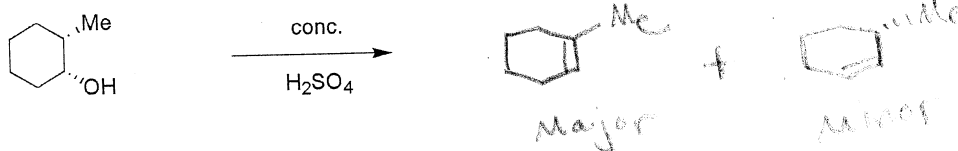
Longest chain is 7 carbons,  
not 5  
2-methyl-3*E*-heptene

(*Z*)-2-methyl-2-butene

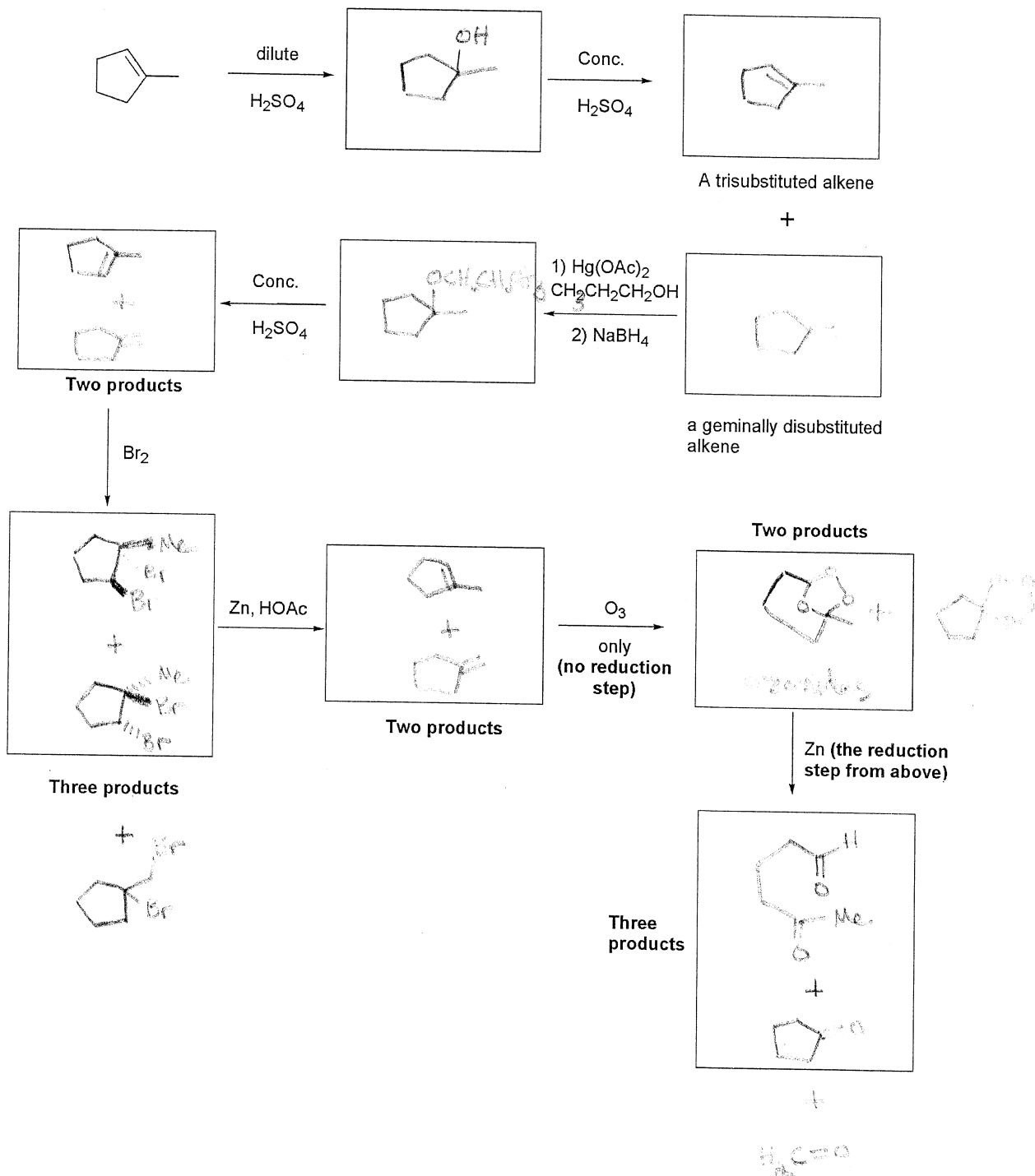


Two methyl substituents:  
no *E*/*Z* possibility  
2-methyl-2-butene

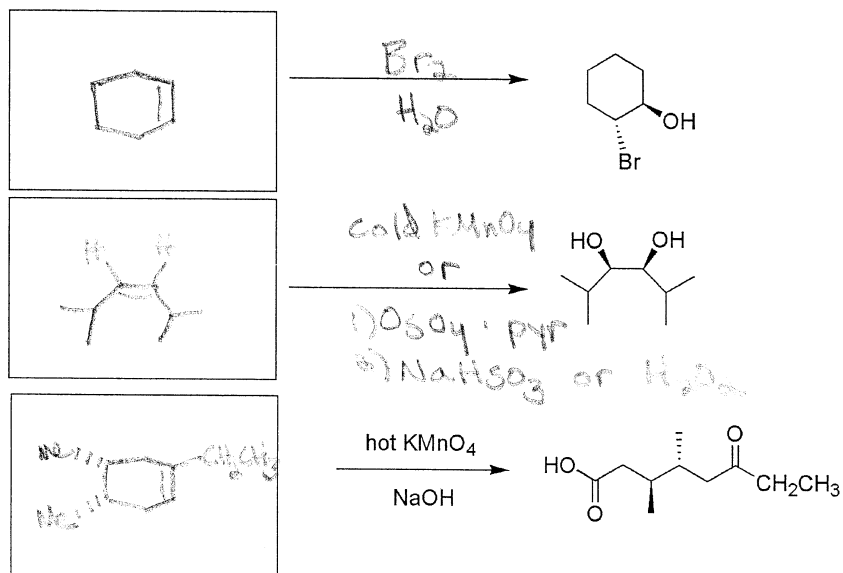
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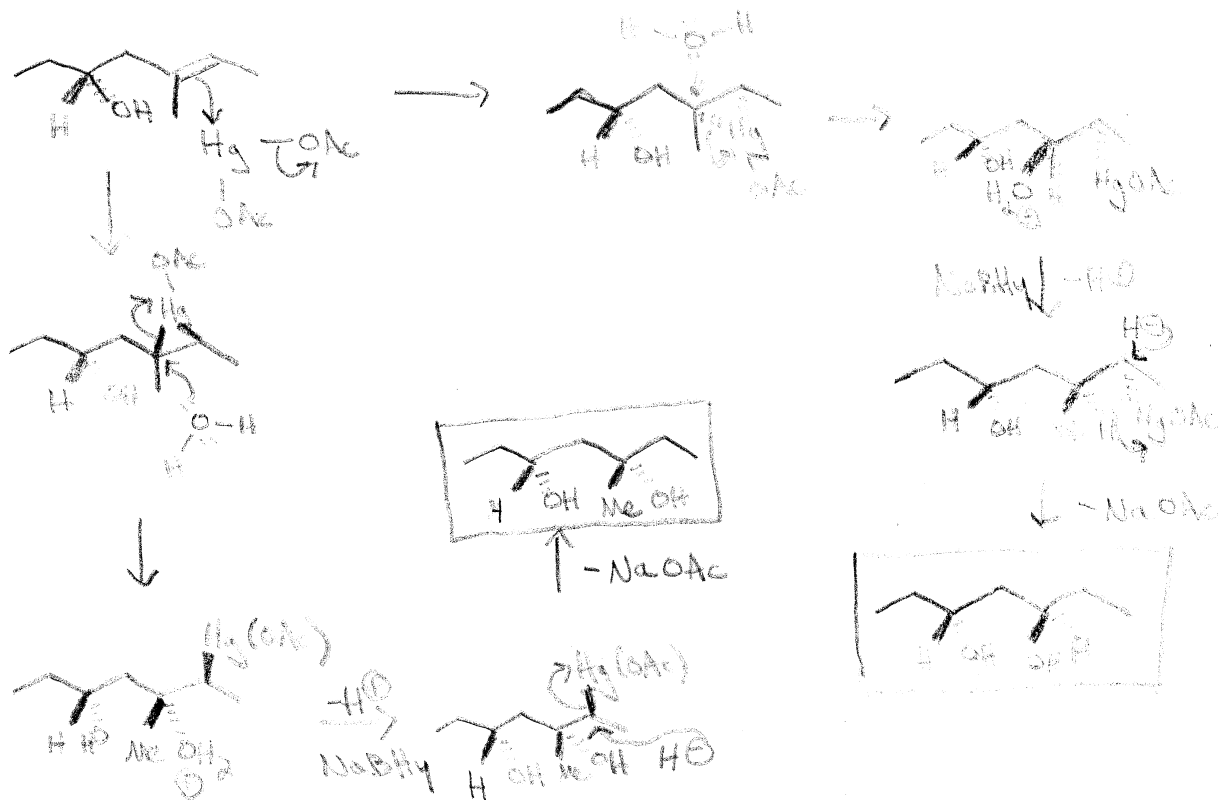


(3 pts each) Provide the reagents and/or starting materials required to synthesize the following compounds:



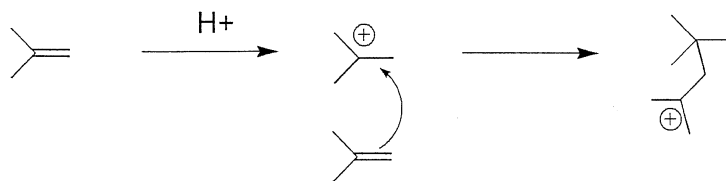
(12 pts) Provide a detailed mechanism, using "curved arrow formalism," for the following reaction. **Show the formation of all possible products.** Remember to specify stereochemistry where appropriate:

**The oxymercuration/demercuration of 3-R-hydroxy-5-methyl-(5E)-heptene**

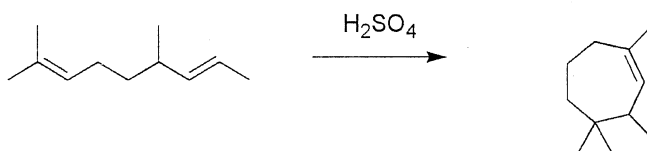


## Part II (EXTRA CREDIT!!!)

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With this in mind, let's develop a stepwise mechanism for the following reaction:



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