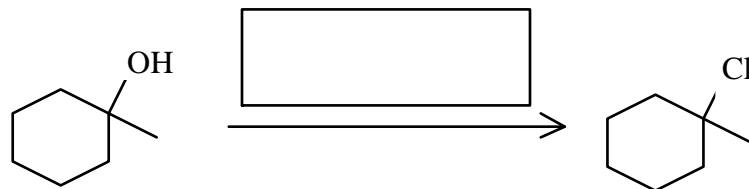
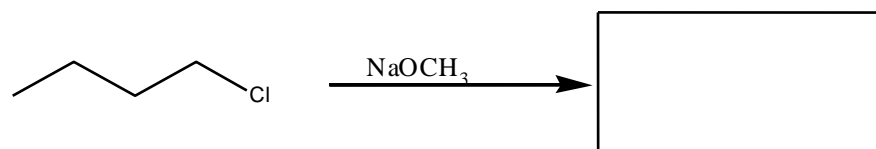


1. Supply the missing reactant, conditions, or product.

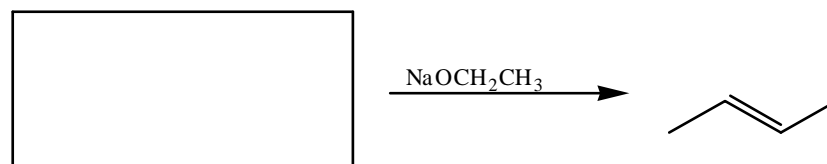
a)



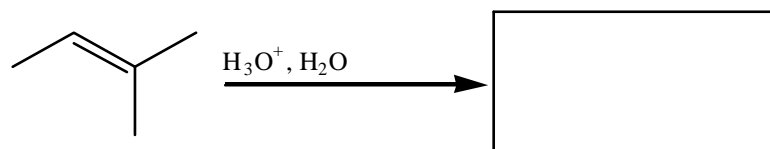
b)



c)

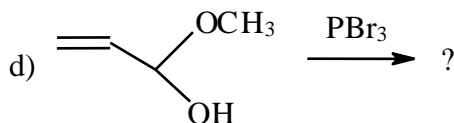
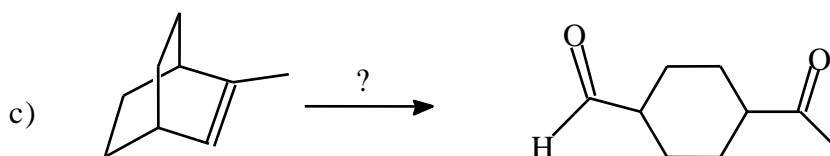
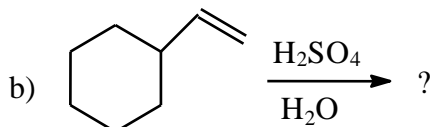
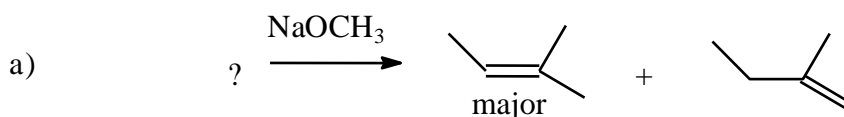


d)



2. Suggest a synthesis of cyclopentene from cyclopentane. *Hint: this takes more than one step!:*

1. Give the structure of the major organic product(s) or supply the missing reactant/conditions or starting material. Show the stereochemistry of the products or starting material, if applicable.



2. Suggest an efficient synthesis of the following compounds:

a) Butylcyclohexane from ethane

b) *Trans*-2-butene from 2,3-dibromobutane

3. Propose a curved-arrow mechanism for the following reaction:

