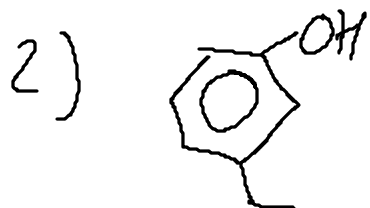


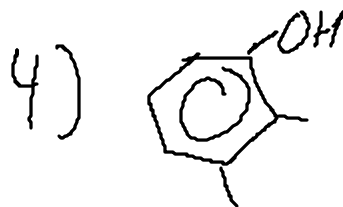
1. (4 pts) Provide the structures and names of four (4) structural (constitutional) isomers that are alcohols or phenols and have the molecular formula $C_8H_{10}O$.



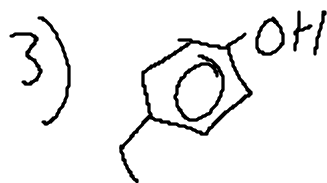
2-ethylphenol



3-ethylphenol

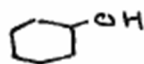


2,3-xyleneol

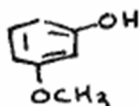


4-ethylphenol

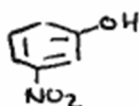
2. (1 pt) Rank the following compounds from most (1) to least (4) acidic.



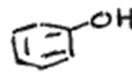
4



1



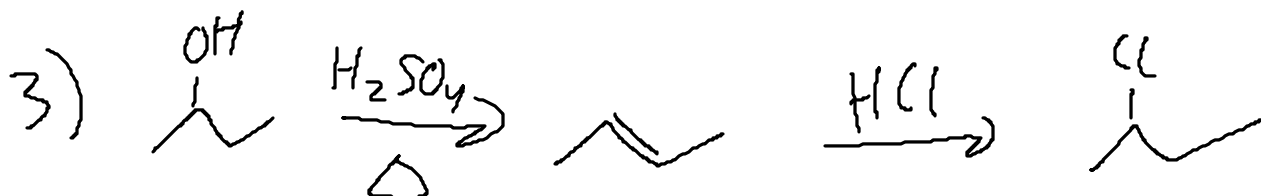
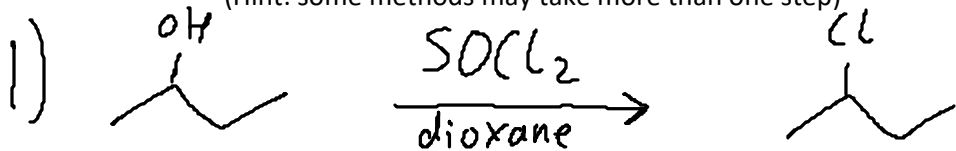
2



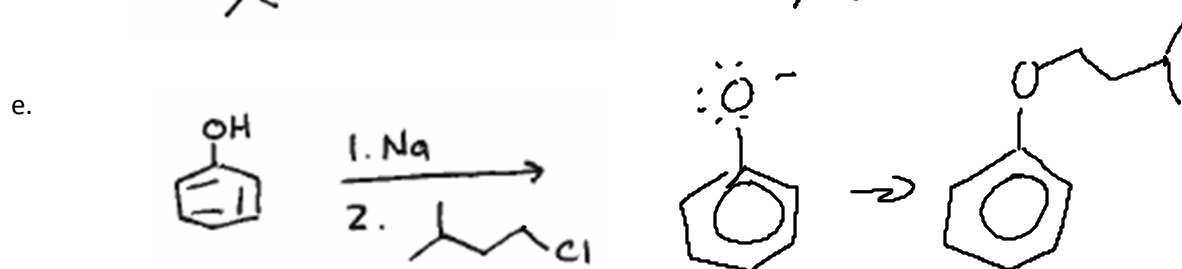
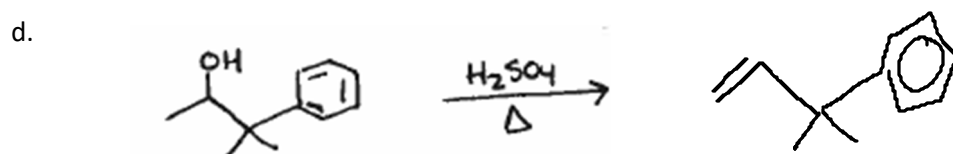
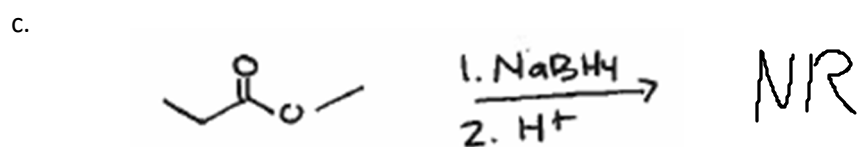
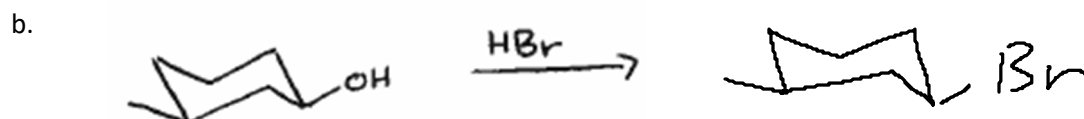
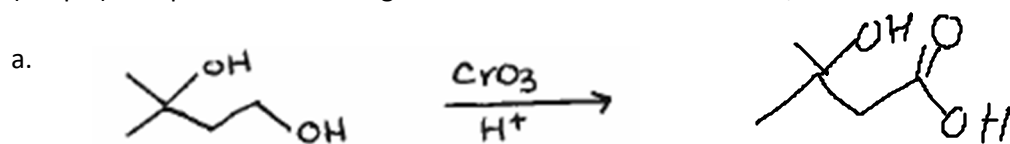
3

3. (6 pts) Identify three ways to convert 2-butanol to 2-chlorobutane. Write each reaction.

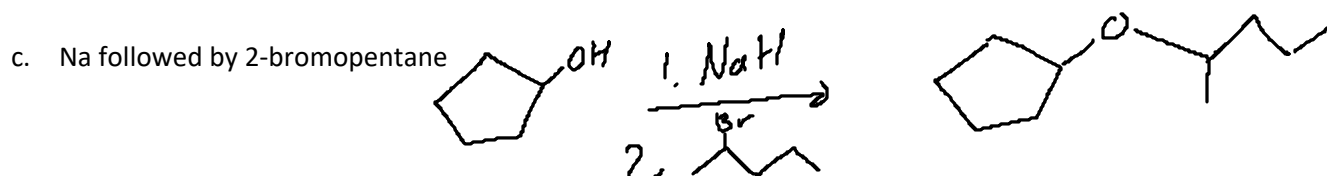
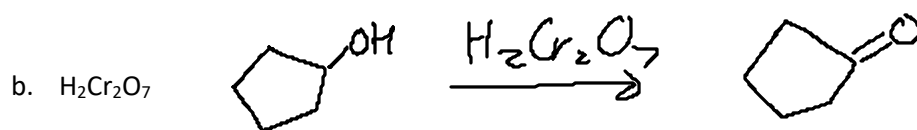
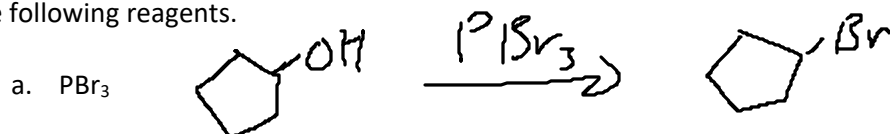
(Hint: some methods may take more than one step)



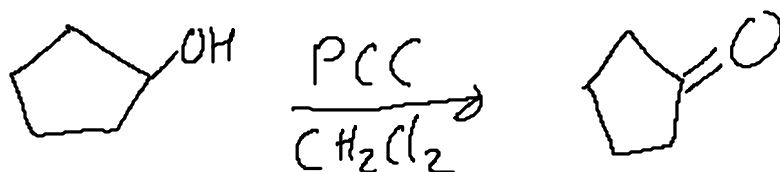
4. (7.5 pts) Complete the following reactions. If there is no reaction, write NR.



5. (6.5 pts) Draw cyclopentanol. Then, draw the products you would obtain from reaction of cyclopentanol with the following reagents.



d. Pyridinium chlorochromate (PCC)



6. (5 pts) Identify the type of alcohol (1° , 2° , 3° , allylic, benzylic) for the compounds from questions 4, 5, and 7.

4a(left) 3°

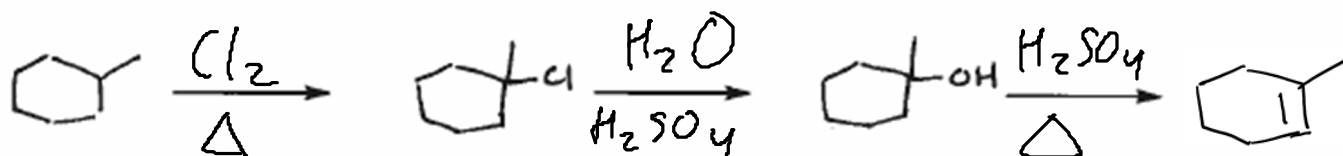
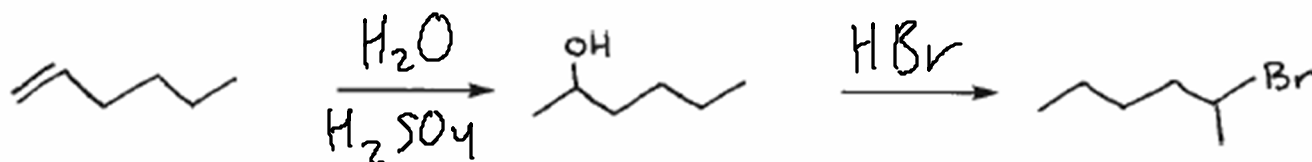
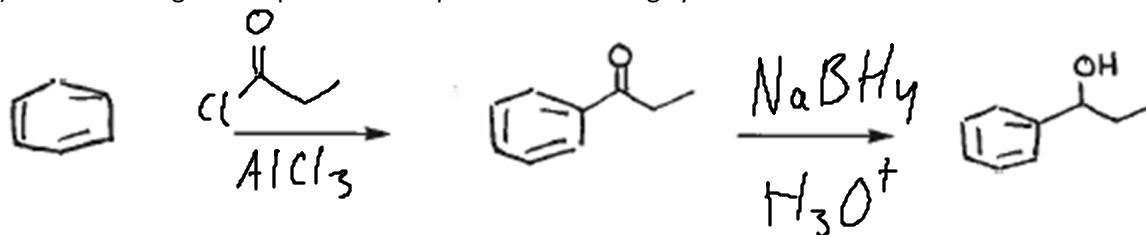
4e benzylic

4a(right) 1°

5 2°

~~4a~~ 7a (final product) 2°

7. (7 pts) Show the reagents required to complete the following synthesis.



8. (3 pts) Show how you would synthesize diisobutyl ether using isobutyl chloride as your only source of carbon (all of the carbon atoms in the product MUST come from isobutyl chloride). You have as much isobutyl chloride as you need.

