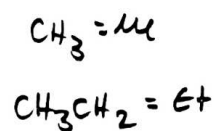
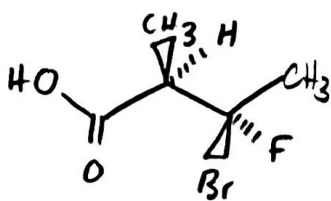
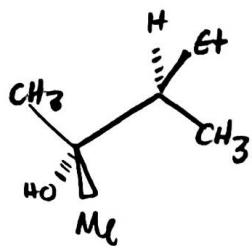


① Draw the following in a Newman projection.

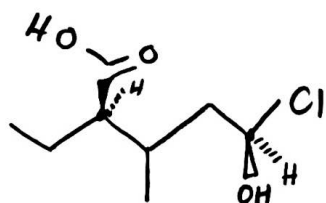


② consider the Newman projections drawn in Q1 what would be the most stable configuration for the both? Draw it.

③ Determine whether the following pair of molecules are enantiomers.



④

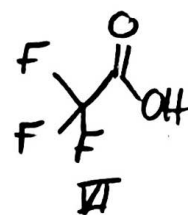
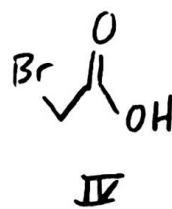
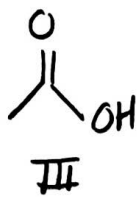
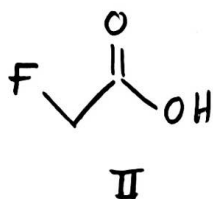
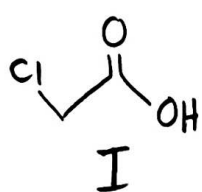


a) Draw arrows to indicate the chiral stereocenters.

b) for the chiral stereocenters determine if they are (R) or (S)

⑤

Order the following in order of increasing acidity



⑥ are your hands enantiomers?

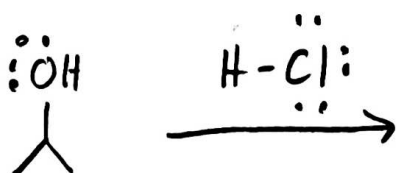
Define enantiomers.

⑦ Determine if the following are  $S_N1$  or  $S_N2$ , draw the reaction and products

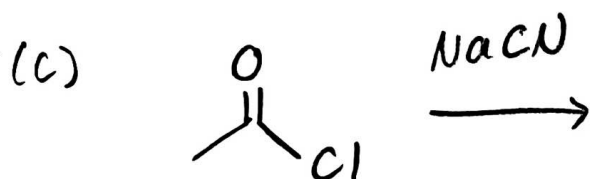
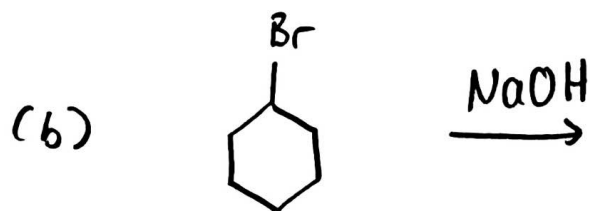
a) H3C-Cl reacts with  $OH^-$

b) CC(C)(C)OC(=O)C reacts with NaCl

⑧ Draw the first step for the following reaction



(9) Draw the products of the following reactions



### CHALLENGE QUESTION

(10) Draw the correct arrows to create the given product from the starting material

