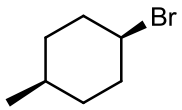
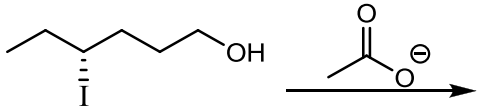
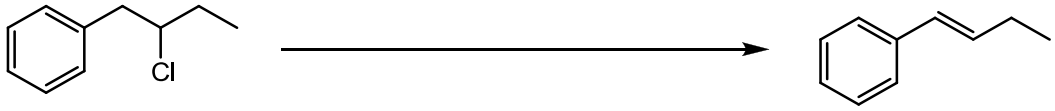
Several mechanisms form the core reactions for understanding organic mechanisms. Among these, the most common are S_N1, S_N2, E1 and E2. You should have completed the substitution and elimination worksheets already. In this worksheet, you will determine which of the four is operating.

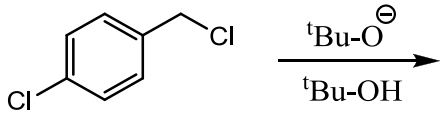
Background: Using the substrate below and any nucleophile/base you desire, draw out an example of an S_N1, S_N2, E1, and E2 reaction. Take note of the differences in these reactions, and use this analysis to complete the reactions in the next question.

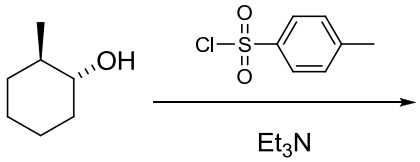


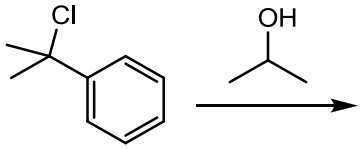
Reactions: Give the structure of the major product(s) or the reagents necessary to complete each of the following reactions. If necessary, indicate the product stereochemistry.

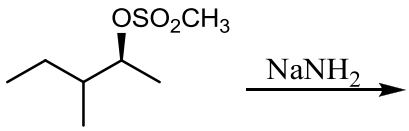


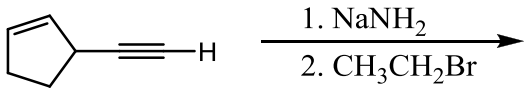




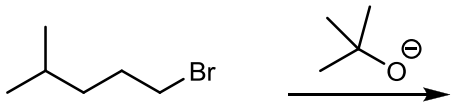


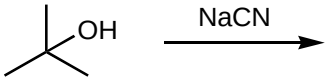

Cl
OH

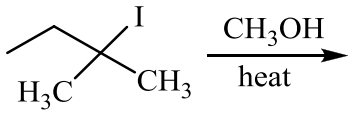

OSO2CH3
NaNH2

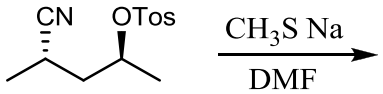

H
1. NaNH2
2. CH3CH2Br

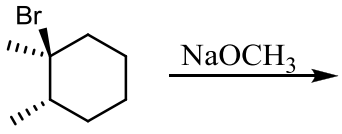

OTos
O
O


Br
O


OH
NaCN


I
H3C
CH3
CH3OH
heat


CN
OTos
CH3S Na
DMF


Br
NaOCH3

Mechanisms: Draw out a step-by-step reaction mechanism for the transformations shown below. Include all intermediates, charges, and electron-pushing arrows needed for the transformation.