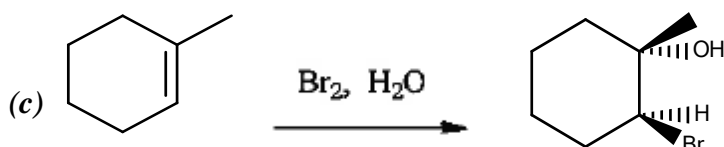
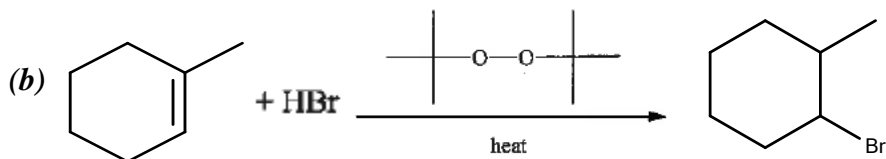
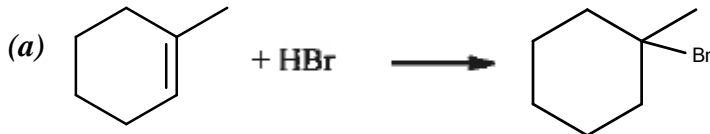


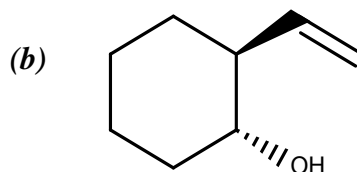
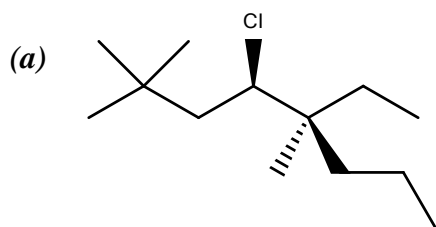
## Organic Chemistry Practice Problems

### Organic Chemistry I Practice Set #8 (Chapters 5-7 – Carey)

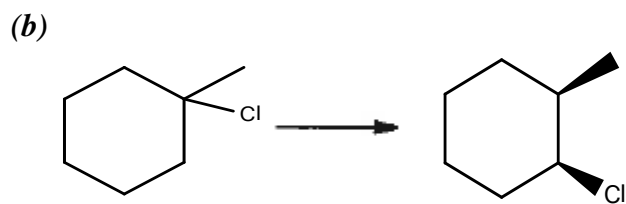
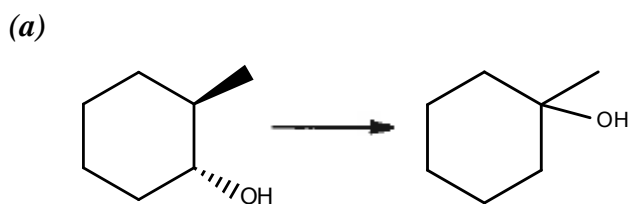
- 1) Using arrows to show the flow of electrons, write a stepwise mechanism for each of the following reactions. If the reaction proceeds via a free-radical mechanism, label the steps appropriately.



- 2) Provide a structural formula for (a) poly(vinyl chloride) and (b) (2R,3R)-3-bromopentan-2-ol.
- 3) Name the following compounds. Be sure to designate the configurations in stereoisomers correctly.

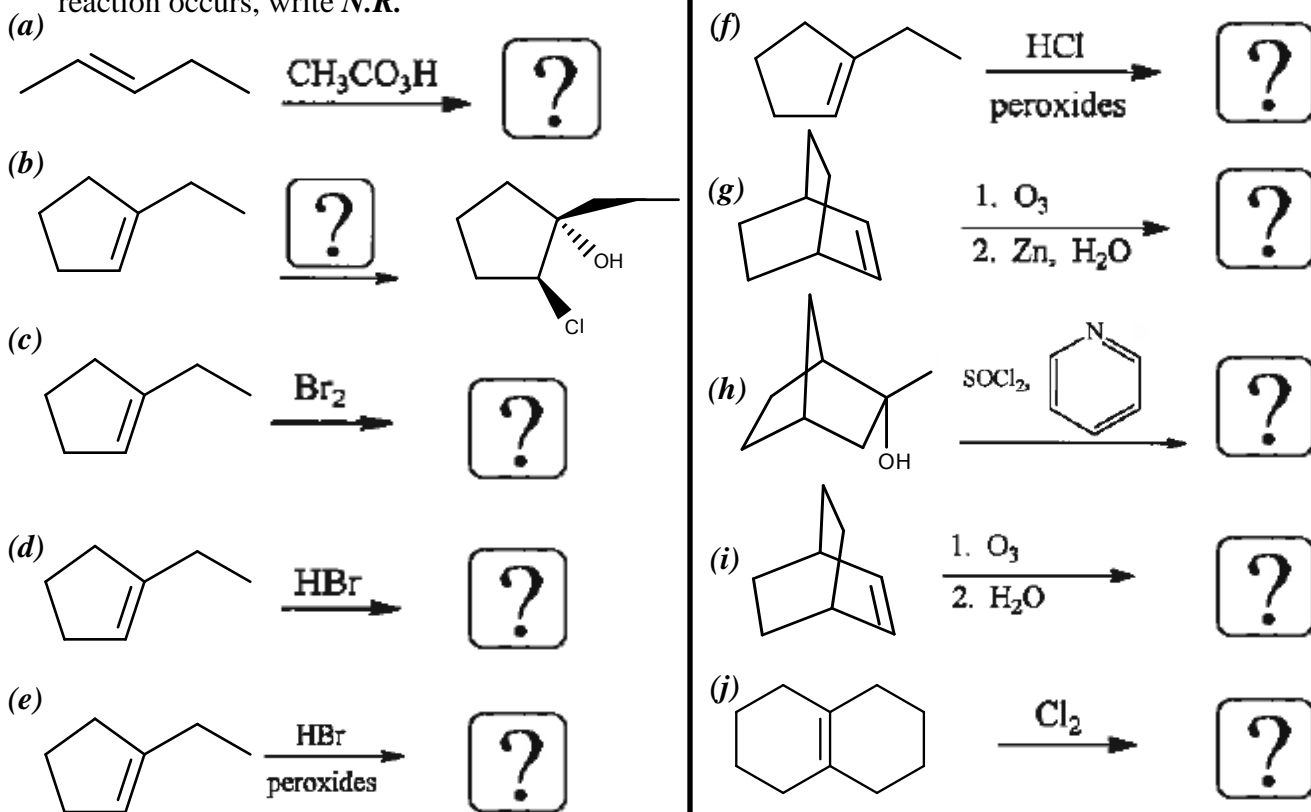


- 4) Provide an efficient multistep synthesis for each of the following conversions of the given starting material into product. For each transformation, give all necessary reagents and catalysts and give a structural formula of the organic product. Show stereochemistry appropriately when necessary.

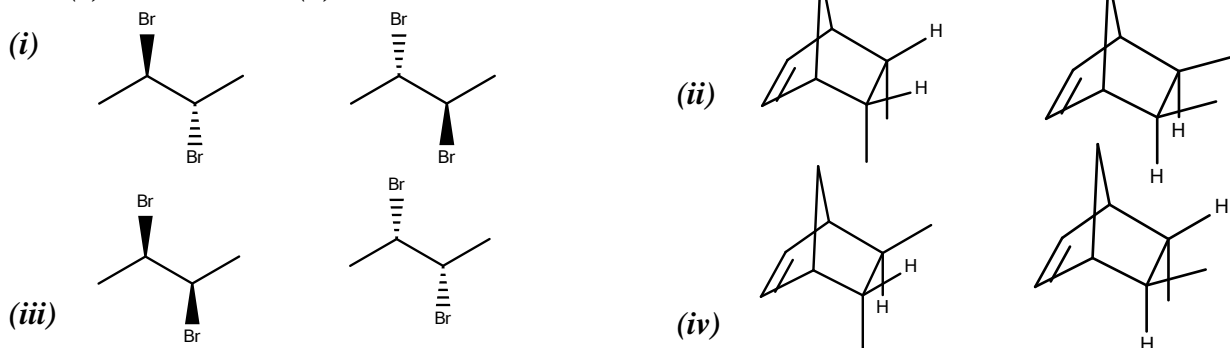


## Organic Chemistry Practice Problems

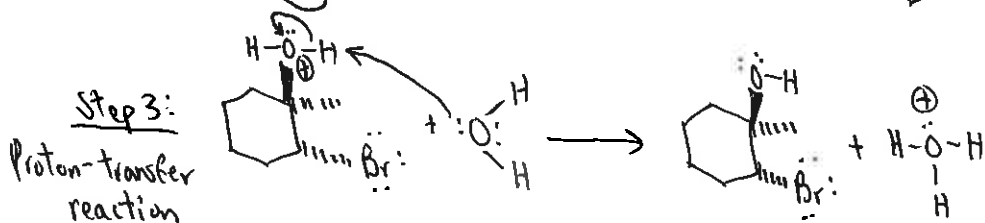
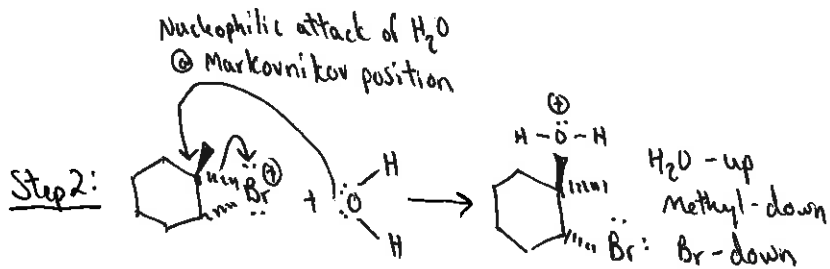
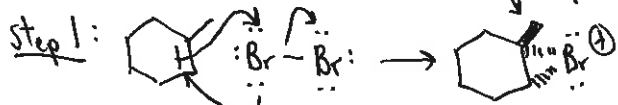
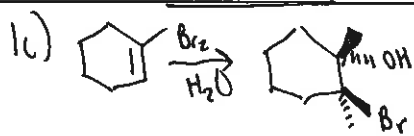
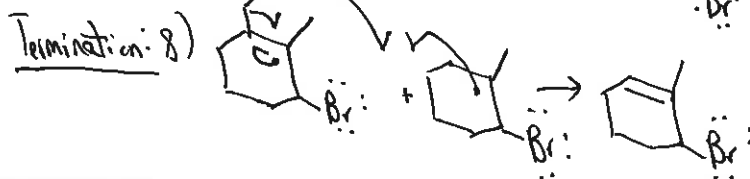
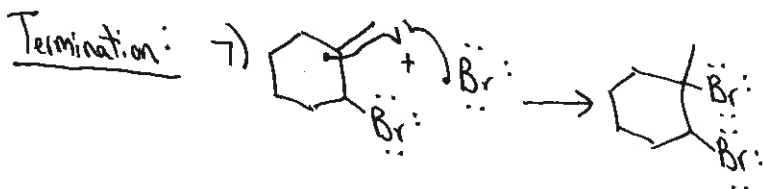
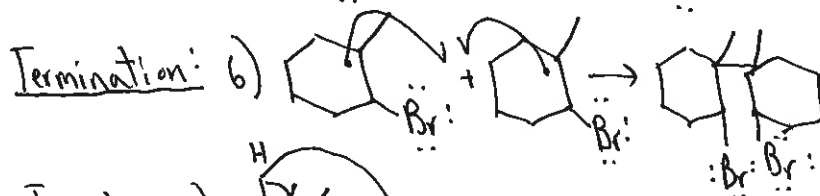
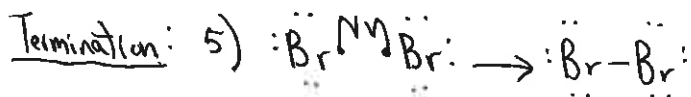
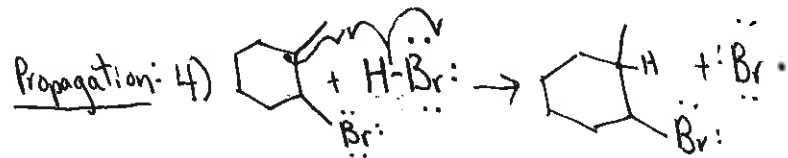
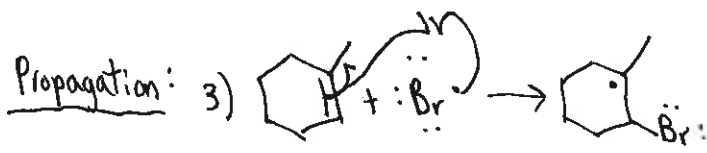
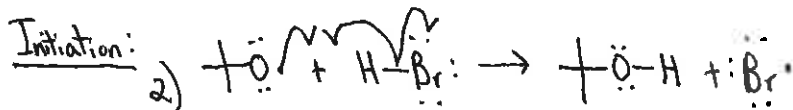
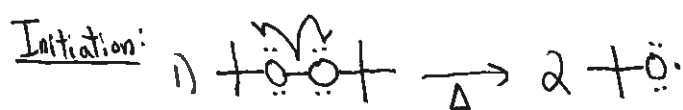
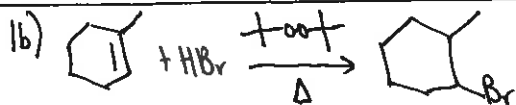
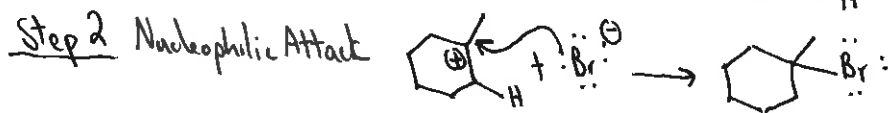
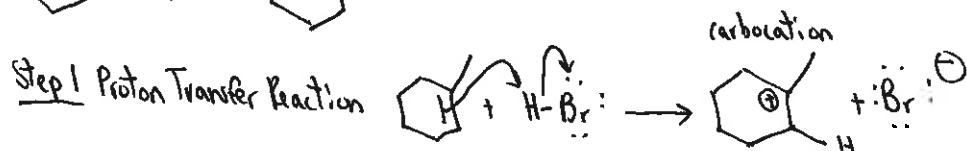
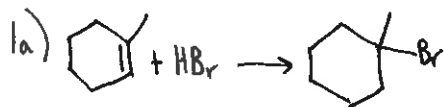
- 5) Fill in what is missing. Either give all of the missing reagents to complete the reaction or give a structural formula for the *major organic product(s)*. Show stereoisomers properly if necessary. If no reaction occurs, write *N.R.*



- 6) (i) Which has the larger heat of hydrogenation: (a) (E)-2-pentene (b) (Z)-2-pentene  
 (ii) Which has the smaller heat of combustion: (a) (E)-cyclodecene (b) (Z)-cyclodecene  
 (iii) Which is thermodynamically less stable: (a) isobutyl radical (b) *tert*-butyl radical  
 (iv) Which is the rate law for an E2 reaction: (a) rate =  $k[\text{RX}]$  (b) rate =  $k[\text{RX}][\text{base}]$   
 (v) Which reacts fastest with propene: (a) HF; (b) HCl; (c) HBr; (d) HI  
 (vi) Which is thermodynamically more stable: (a) 1-methylhexyl cation (b) 3-methylhexyl cation  
 (vii) Which one will proceed via an E1 reaction to produce an alkene:  
 (a) heating *tert*-butyl chloride in ethanol w/sodium ethoxide (b) heating *tert*-butyl chloride in ethanol
- 7) The relationship of each pair of molecules: (a) same molecule (b) constitutional isomers  
 (c) diastereomers (d) enantiomers



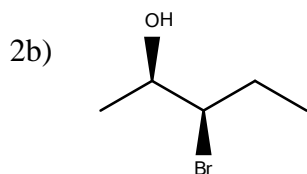
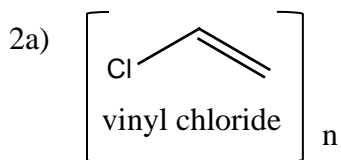
## Organic Chemistry I Answers to Practice Set #8 (Chapters 5-7 - Carey)



Final product → Br + H<sub>2</sub>O anti to each other  
OH → Markovnikov position

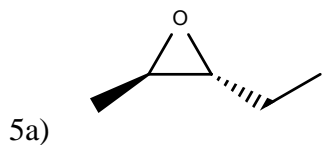
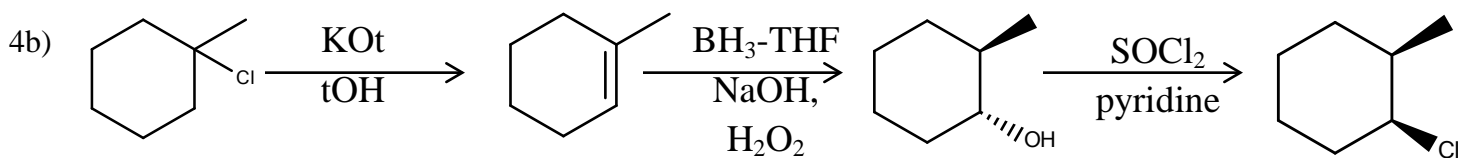
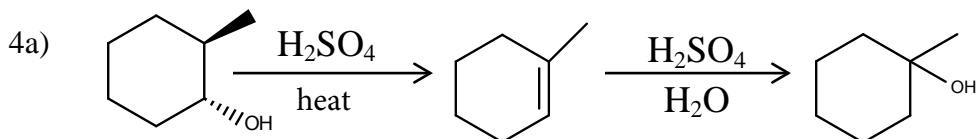
## Organic Chemistry Practice Problems

### Organic Chemistry I Answers to Practice Set #8 (Chapters 5-7 – Carey)

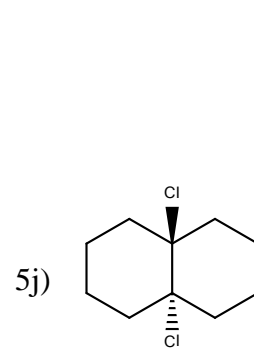
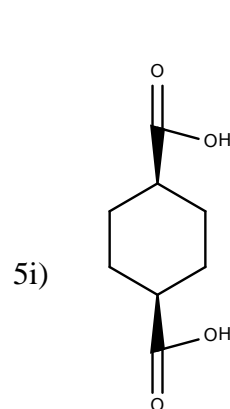
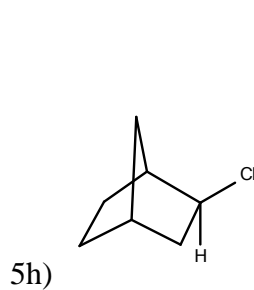
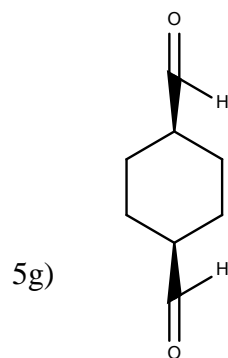
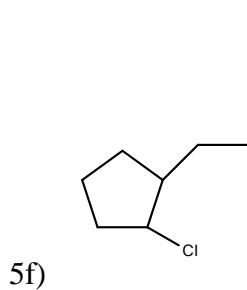
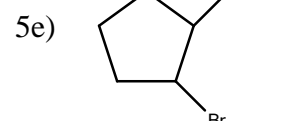
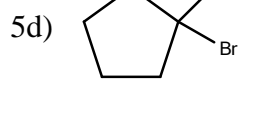
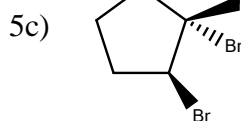


3a) (4R,5R)-4,5-dichloro-5-ethyl-2,2-dimethyloctane

3b) (1R,2S)-2-vinylcyclohexanol



5b) Cl<sub>2</sub>, H<sub>2</sub>O



6i) b 6ii) b 6iii) a 6iv) b 6v) d 6vi) a 6vii) b

7i) a 7ii) c 7iii) d 7iv) d