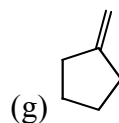
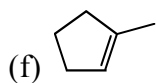
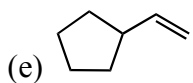
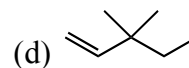
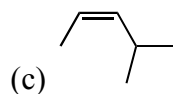
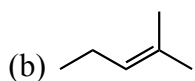
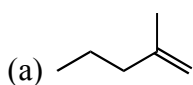


### Chem. 218 Problem Set 3

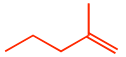


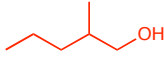

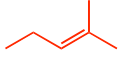
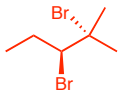
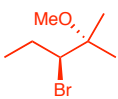
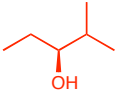

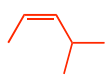
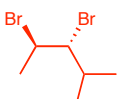
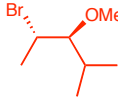
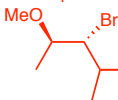
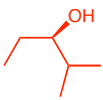
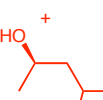






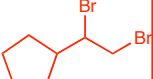
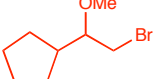
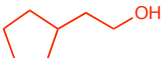


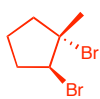
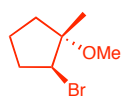



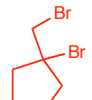



Recommended Problems: 10.21-10.24, 10.26, 10.28-10.33, 10.46-47 (e, f, h, i), 10.48-10.49, 10.50 (c, d, e, f, h), 10.52 (a, b), 10.53 (c, d, f), 10.62-10.64, 10.66, 12.16, 12.37 (d, e, j, k), 12.39 (b, e, f), 12.55, 12.66

(1<sup>st</sup> ed: 10.20-10.24, 10.26, 10.28-10.32, 10.44-45 (e, f, h, i), 10.46-10.47, 10.48 (c, d, e, f, h), 10.50, 10.51 (c, d, f), 10.60-10.62, 10.64, 12.15, 12.35 (d, e, j, k), 12.37 (b, e, f), 12.51, 12.60)

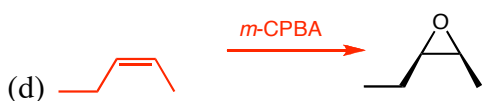
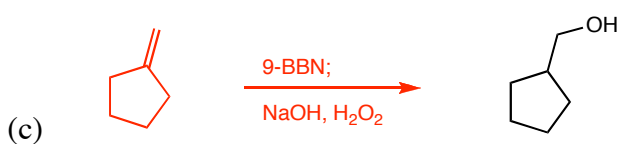
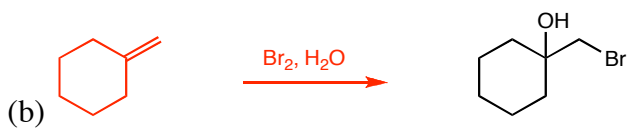
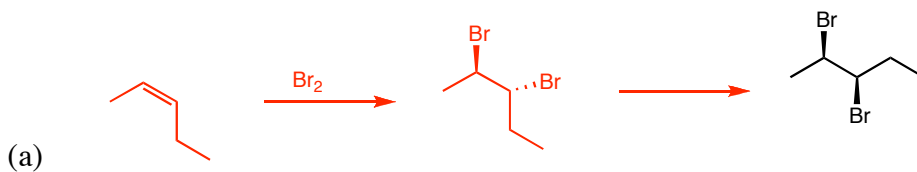
1. Draw the products of reaction of the following compounds with (a)  $\text{Br}_2$  (b)  $\text{Br}_2$ , MeOH (c) 9-BBN; NaOH,  $\text{H}_2\text{O}_2$  (d) *m*-CPBA. Show relevant stereochemistry where appropriate. Make sure you can draw the mechanism for each type of transformation.



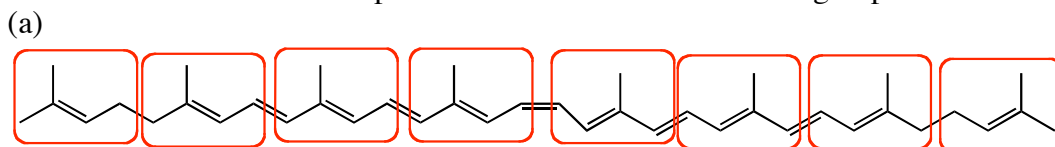
Products are given in the table below. Note that the enantiomer of all chiral compounds will also be formed.

	Br <sub>2</sub>	Br <sub>2</sub> , MeOH	9-BBN; NaOH, H <sub>2</sub> O <sub>2</sub>	<i>m</i> -CPBA
				
				
		 + 	 + 	
				
				
				
				

2. Give an alkene precursor and the reagents necessary to form the following compounds:

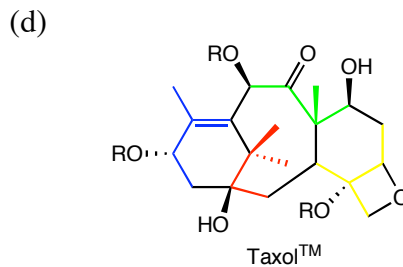
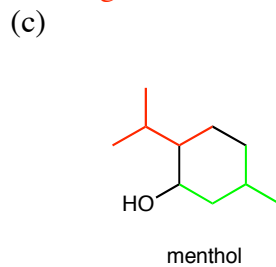
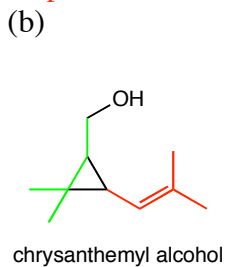


3. Circle the five-carbon isoprene units in each of the following terpenes:



lycopene (responsible for the red color in tomatoes, watermelon, grapefruit, guava, papaya, red bell peppers)

Isoprene units in the following shown in different colors.



4. Suggest a mechanism for the formation of the following terpenes from *cis* or *trans* farnesyl pyrophosphate. Keep in mind that biological systems can catalyze reactions not normally available to us in the laboratory. For example, 1° cations may be stabilized by an enzyme and unusual cation shifts may occur.

Note that the original structure of germacrene was incorrect.

