

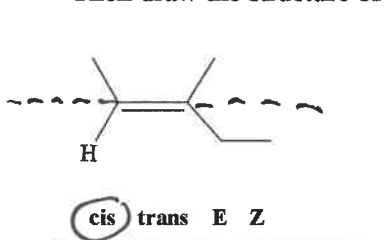
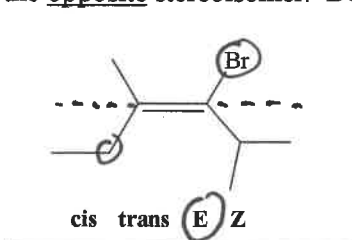
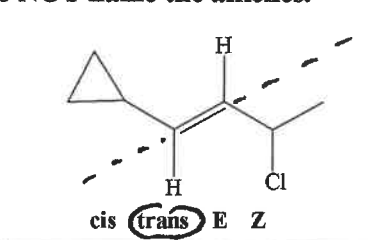
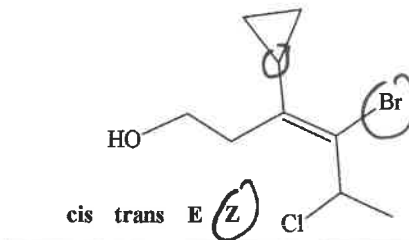
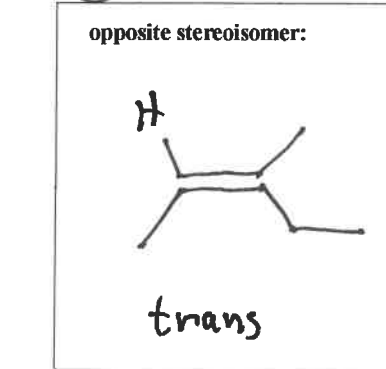
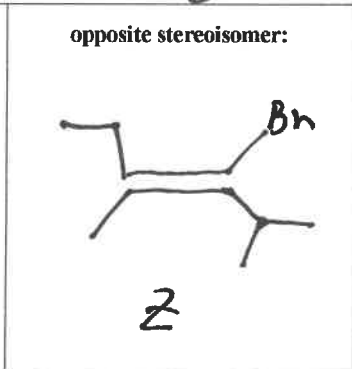
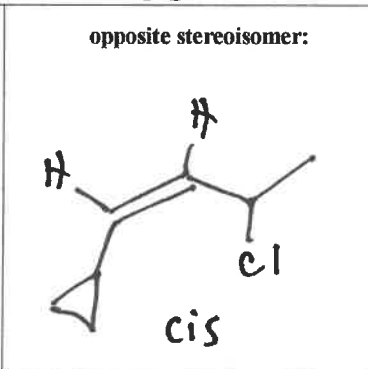
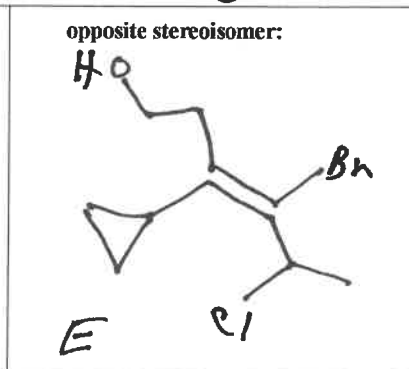
Names of all students (please print) Answer Key

CHEM 243 Organic Chemistry I

Points _____ (10 max)

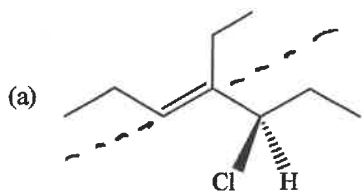
Worksheet #22: November 8, 2021. Complete the following worksheet by collaborating with a group of 3-4 students. You can use a text book or your lecture video notes. You must work together, with the names of all students included on ONE sheet and turned in for a group grade. All the problems on this worksheet are Review Questions for Exam III.

(1) Review: Alkene Geometry. For each alkene below CIRCLE if the geometry is *cis*, *trans*, *E* or *Z*. Then draw the structure of the opposite stereoisomer. Do NOT name the alkenes.

 <p><u>cis</u> trans E Z</p>	 <p>cis trans <u>E</u> Z</p>	 <p>cis <u>trans</u> E Z</p>	 <p>cis trans E <u>Z</u></p>
<p>opposite stereoisomer:</p>  <p>trans</p>	<p>opposite stereoisomer:</p>  <p>Z</p>	<p>opposite stereoisomer:</p>  <p>cis</p>	<p>opposite stereoisomer:</p>  <p>E</p>

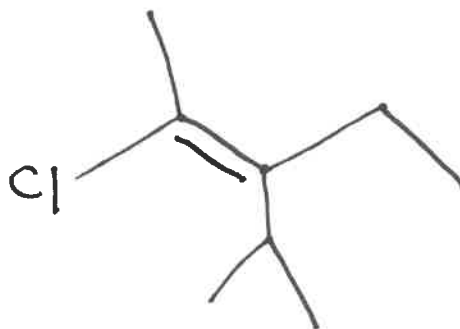
(2) Review: Nomenclature.

- If a name is given draw an accurate zig-zag structure (remember to use wedge and dash bonds for all chiral carbons, and draw the proper alkene geometry).
- If a structure is drawn, give an accurate IUPAC name (don't forget to assign configurations using the R/S prefix, and assign alkene geometry using the *cis*/*trans* or *E*/*Z* prefix).

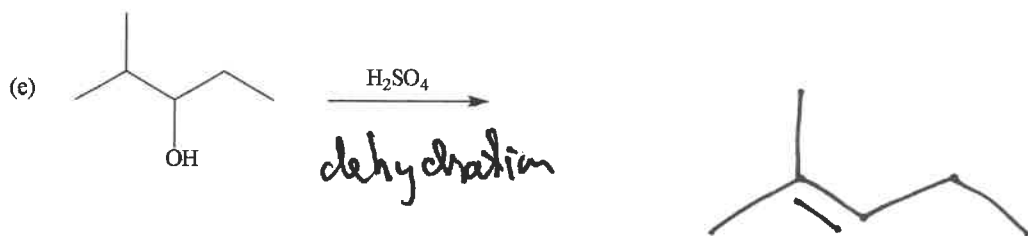
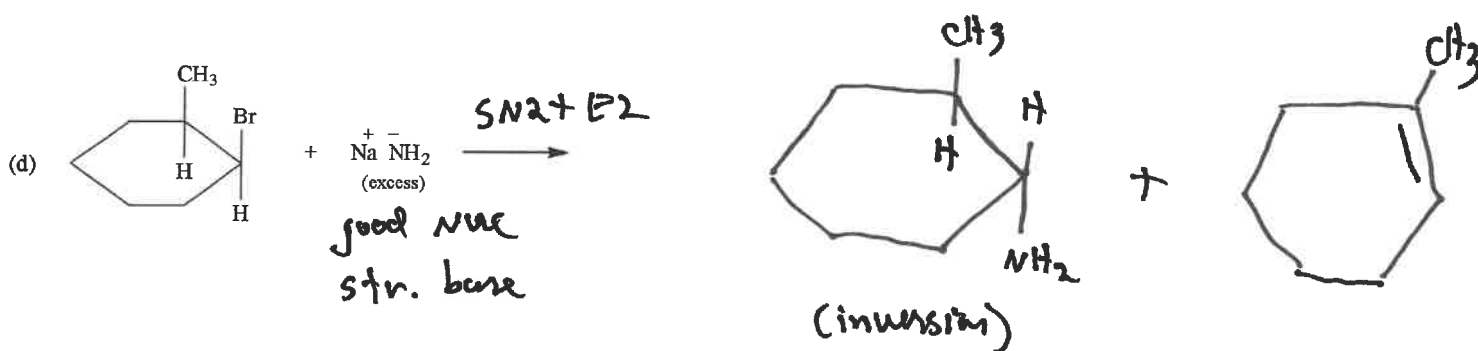
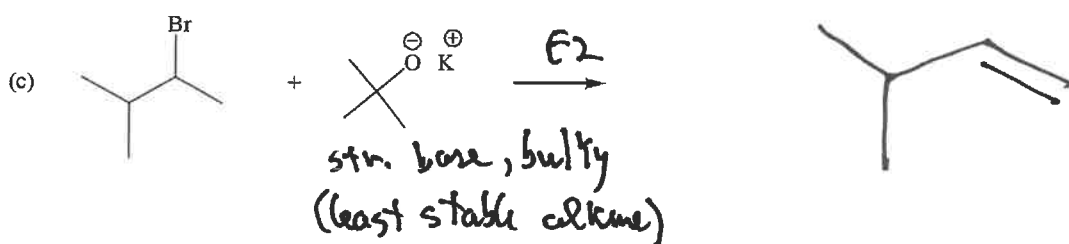
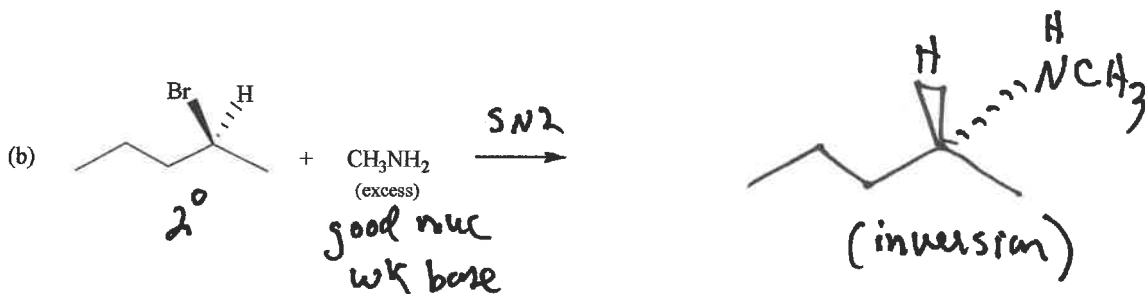
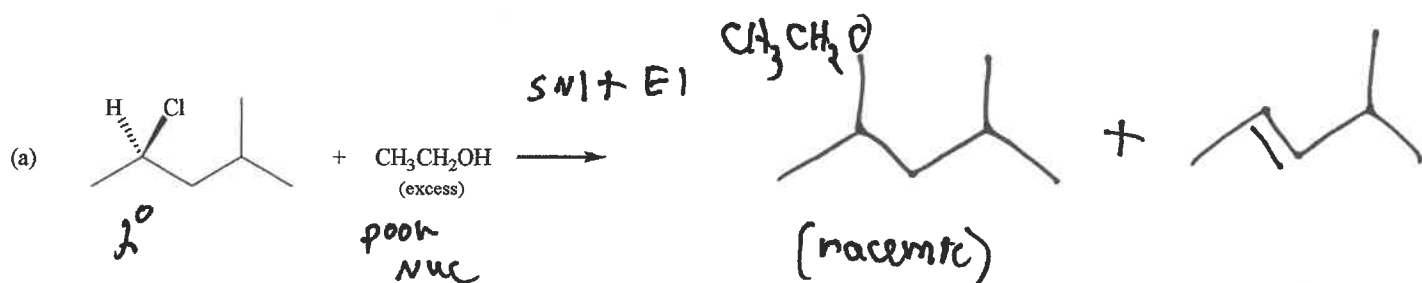


cis-(R)-5-chloro-4-ethyl-3-heptene

(b) (Z)-2-chloro-3-isopropyl-2-pentene

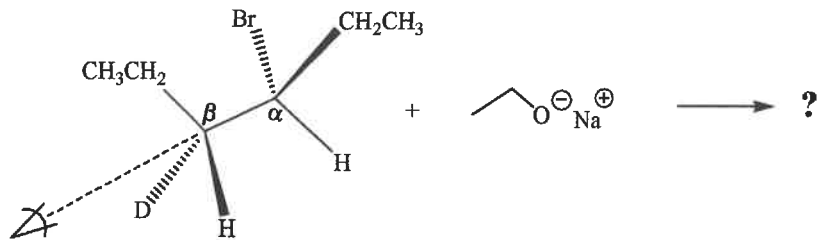


(3) **Reactions.** Complete the reactions shown below by drawing the structure of the major, neutral organic products. Draw the proper stereochemistry, if relevant. It is **NOT** necessary to balance these reactions or write the mechanisms. Remember, these reactions may produce ONE or TWO organic products: SN1 & E1 or SN2 & E2 or SN2 or E2. **Use your Flow Chart!**

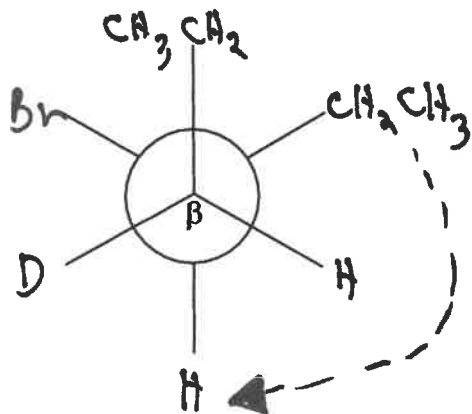


(5) Review: E2 Reaction Stereochemistry.

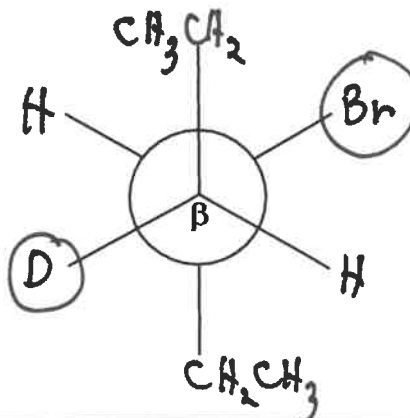
Consider the E2 elimination reaction occurring between the α and β carbons of this alkyl halide. "D" represents deuterium, an isotope of hydrogen.



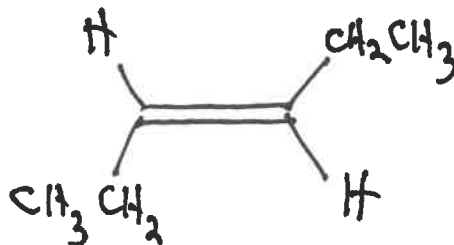
(a) Draw a Newman Projection looking at the β -carbon (as shown):



(b) If necessary, re-draw your Newman projection to give the most stable conformer.



(c) Based on your most stable Newman Projection, draw the major E2 product expected from this reaction. Note that either the β -H or β -D will be eliminated with the leaving group.



(6) Mechanism: E2 Alcohol Dehydration (2 steps). Write a complete mechanism that explains the formation of all products in the balanced Net Equation for the reaction shown below. Your mechanism must consist of a series of individual, balanced chemical equations, and curved arrows to show electron pair movement.

