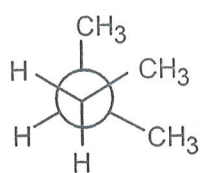
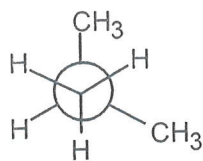


1. Multiple Choice Questions. Circle the correct answer, no penalty for a wrong answer.

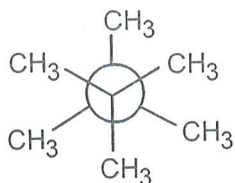
- Which one of the following is a Newman projection of 2,2-dimethylpropane?



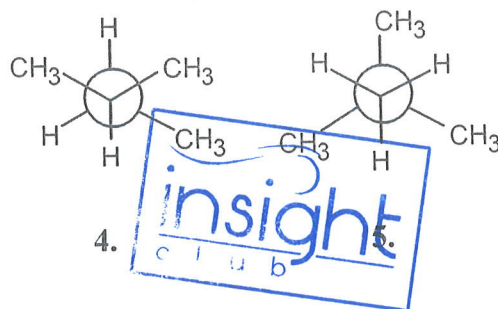
1.



2.



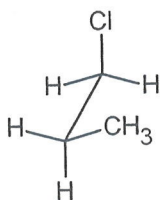
3.



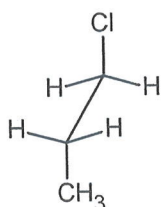
4.

- A. 1
- B. 2
- C. 3
- D. 4
- E. 5

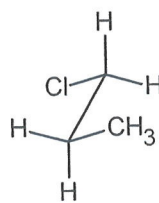
- In which *two* of the following are the methyl group and the chlorine *gauche* to one another?



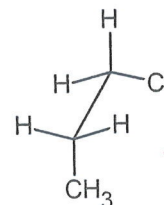
1.



2.



3.

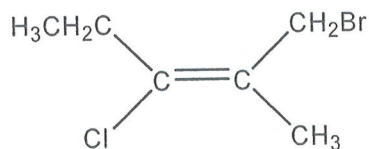


4.

- A. 1 and 2
- B. 1 and 3
- C. 1 and 4
- D. 2 and 4
- E. 3 and 4



- What is the IUPAC name of the following compound?

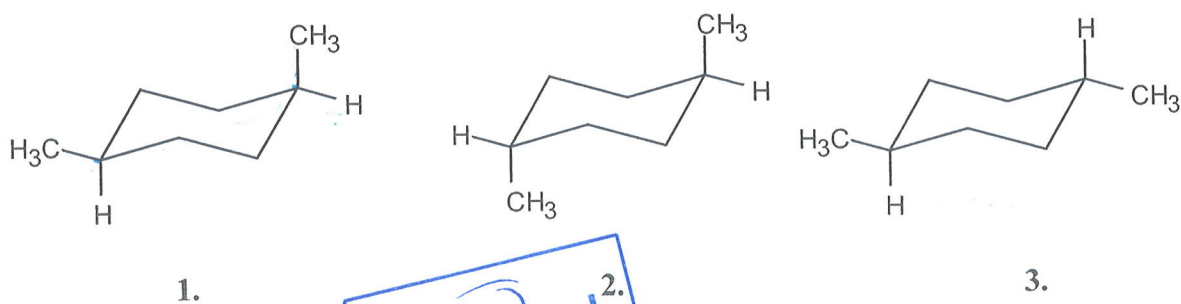


- A. (E)-1-Bromo-2-methyl-3-chloro-2-pentene
- B. (Z)-1-Bromo-2-methyl-3-chloro-2-pentene
- C. (E)-1-Bromo-3-chloro-2-methyl-2-pentene
- D. (Z)-1-Bromo-3-chloro-2-methyl-2-pentene
- E. (E)-3-Bromo-1-chloro-1-ethyl-2-methyl-1-propene

- Only one of the following compounds is named correctly according to the IUPAC rules. Which one?

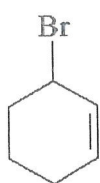
	<i>Structural formula</i>	<i>Proposed name</i>
A.		3,3,5,6-Tetramethylheptane
B.		2,5,6-Trimethyloctane
C.		4-Pentylheptane
D.		tert-Butylcyclopentane

- Which pair of structures below is interconvertible by ring-flips?

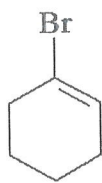


- ~~A.~~ 1 and 2
- B. 1 and 3
- C.** 2 and 3
- D. All of them

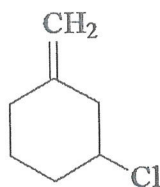
- Identify the *allylic* halide(s).



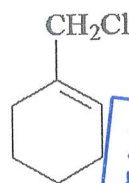
I



II



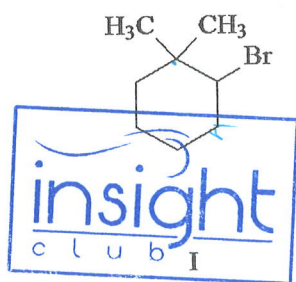
III



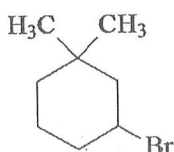
IV



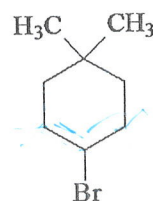
- A. I
 - B. I and II
 - C. I and IV
 - D. only III
 - E. I, III, and IV
- Which one of the following reactions does **not** proceed *via* a carbocation intermediate?
 - A. Acid-catalyzed hydration of $(\text{CH}_3\text{CH}_2)_2\overset{+}{\text{C}}=\text{CHCH}_3$ ✓
 - B. Addition of hydrogen chloride to $(\text{CH}_3\text{CH}_2)_2\overset{+}{\text{C}}=\text{CHCH}_3$ πC
 - C. Alkylation of sodium acetylide with bromoethane
 - D. Dehydration of $(\text{CH}_3\text{CH}_2)_3\text{COH}$ with H_2SO_4 ↗
 - E. E1 elimination of $(\text{CH}_3\text{CH}_2)_3\text{CCl}$ ↗
- Which of the following compounds gives a single E2 product on reaction with sodium ethoxide, $\text{NaOCH}_2\text{CH}_3$?



I



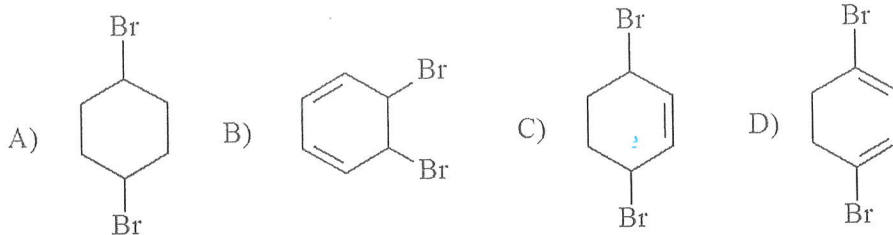
II



III

- A. I
- B. I and II
- C. I and III
- D. II and III
- E. I, II, and III

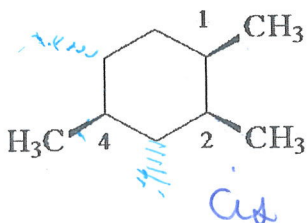
- Which of the following is the 1,4-addition product of Br₂ to 1,3-cyclohexadiene?



- A. A
B. B
C. C
D. D

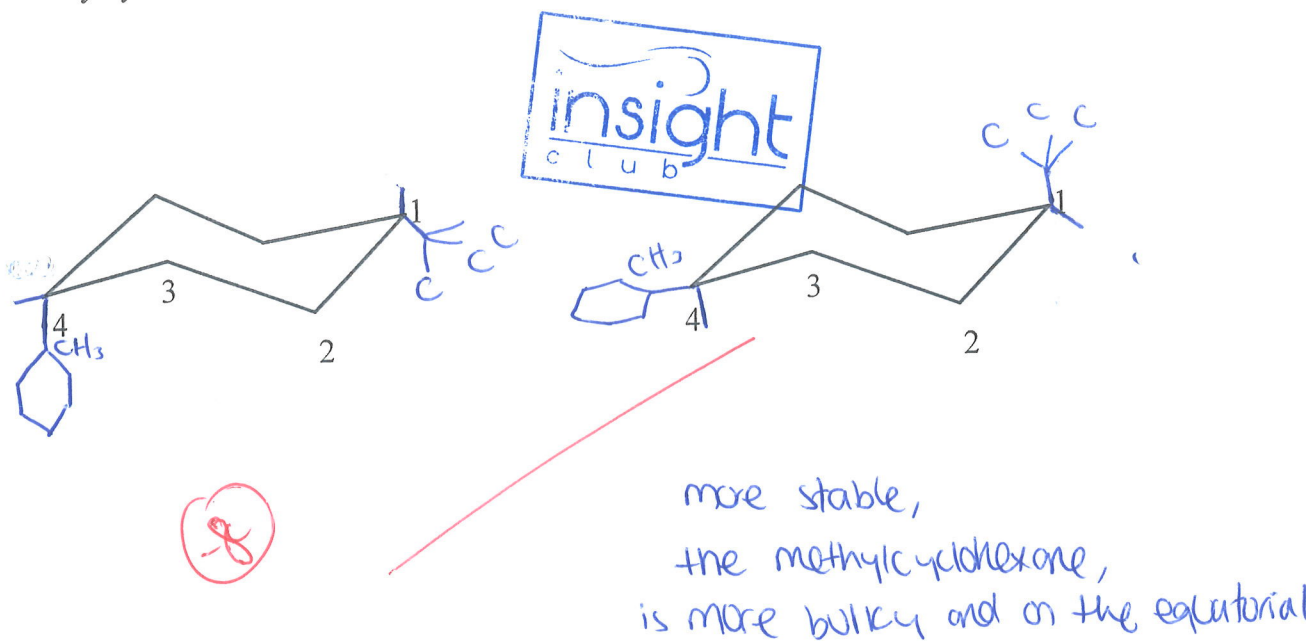


- The *most stable* conformation of the compound shown has

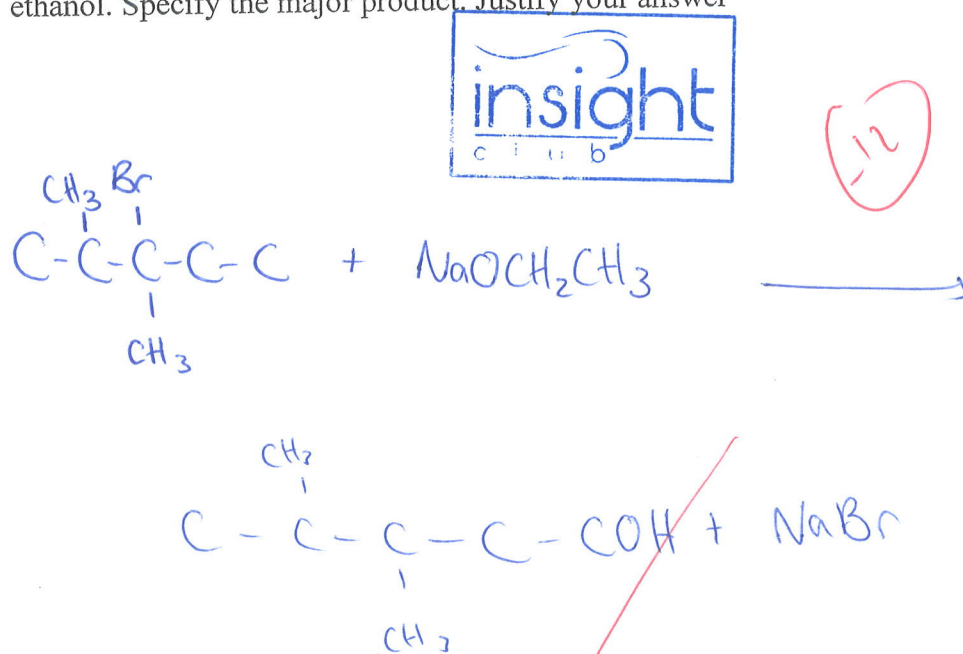


- ~~A.~~ all methyl groups equatorial.
 B. equatorial methyl groups at C-1 and C-4, axial at C-2.
 C. equatorial methyl groups at C-1 and C-2, axial at C-4.
~~D.~~ equatorial methyl groups at C-2 and C-4, axial at C-1.

2. Draw clear depictions of *two nonequivalent* chair conformations of cis-1-Isopropyl-4-methylcyclohexane, indicate which is more stable. Justify your answer.

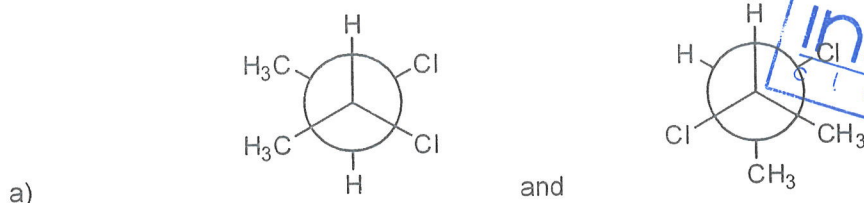


3. Draw the structures of all alkenes including stereoisomers that can be formed from the E₂ elimination of 3-bromo-2,3-dimethylpentane with sodium ethoxide NaOCH₂CH₃ in ethanol. Specify the major product. Justify your answer



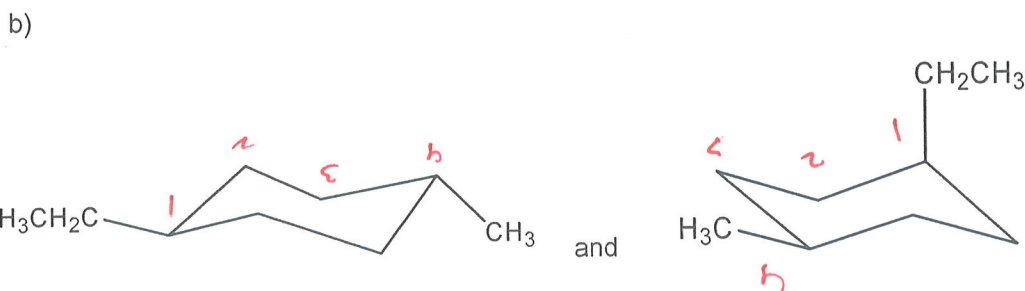
the Na will bind with the halogen group and the structure will form an alcohol

4. Determine whether the structures in each of the following pairs represent; Constitutional isomers, different conformations of the same compound, stereoisomers that cannot be interconverted by rotation about a single bond; diastereomers.



Answer

different conformations of the same compound.

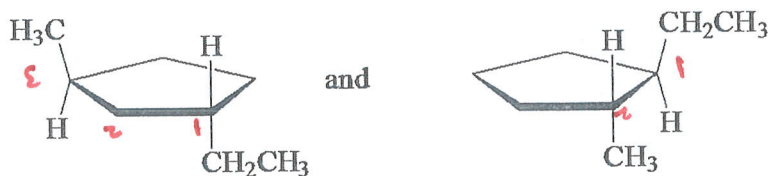


Answer

Constitutional isomers

-4
diastereomers.

c)

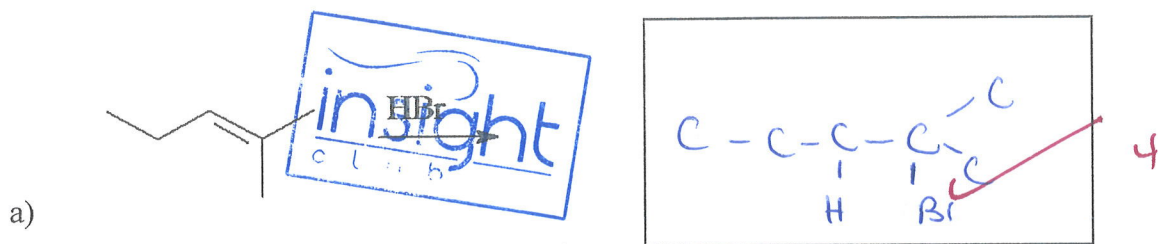


Answer

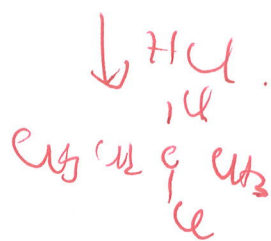
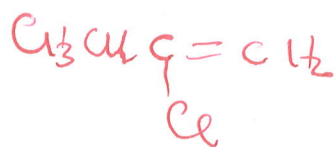
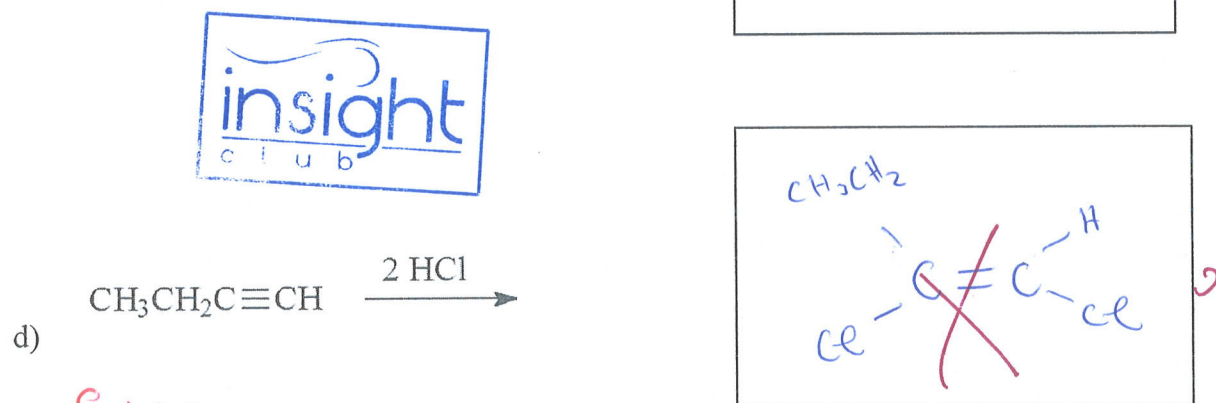
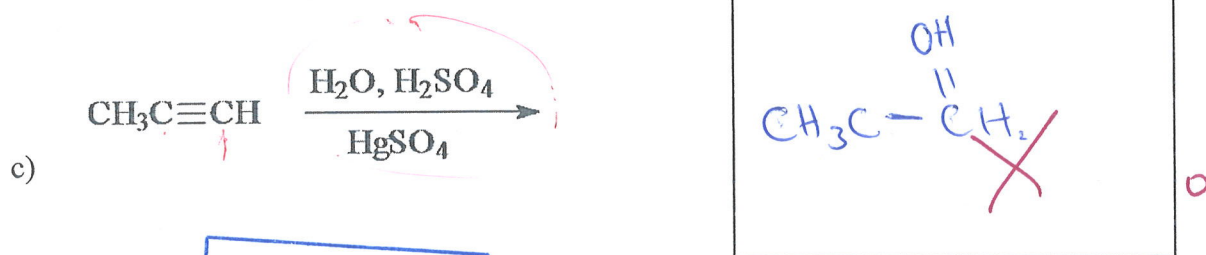
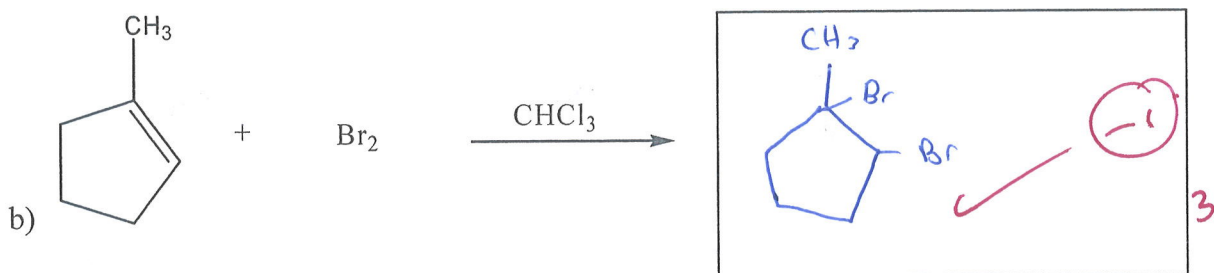
stereoisomers, diastereomers

-4
constitutional

5. Give the stereochemical structure of the major product of each of the following reactions.

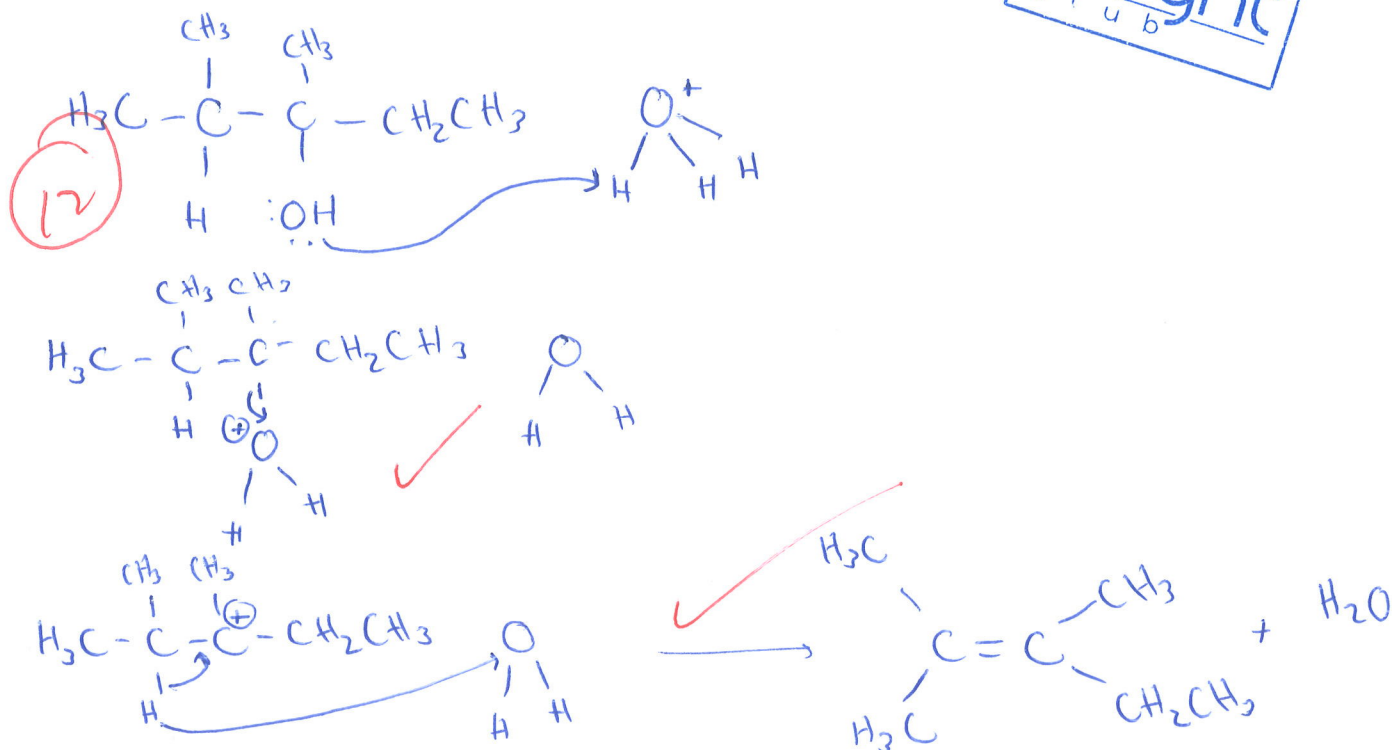
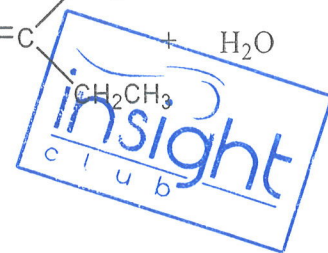
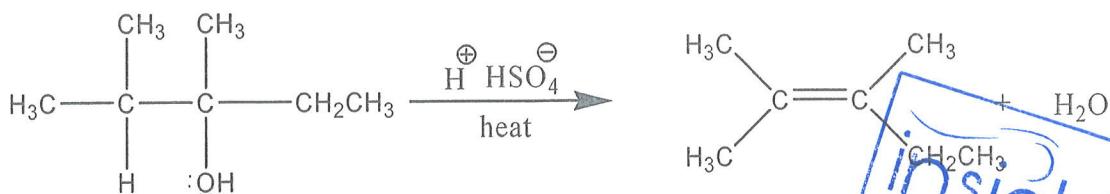


7



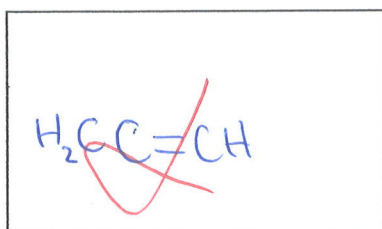
WAAAA

6. Give a reasonable mechanism for the following reaction. Vague movement of electrons receives no credit.

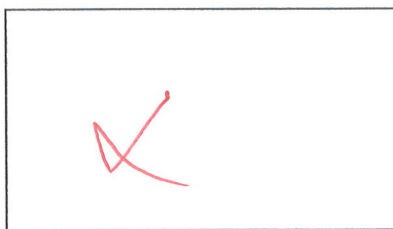


Bonus question (6pts)

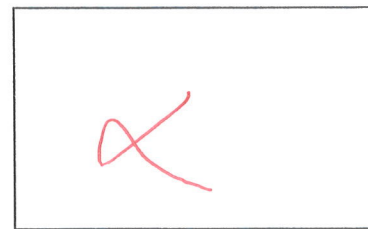
What is the structure of compounds A, B, C in the following series of reactions



Compound A



Compound B



Compound C