1. What is wrong with the IUPAC nomenclature for each skeletal structure shown below? Correct them with their proper IUPAC nomenclatures.

![Structure 1](image1.png) 5-isopropyl-5-methylpentane

![Structure 2](image2.png) 2,3-diethyl-7,7-dimethylnonane

![Structure 3](image3.png) 4-isopropyl-3,5,7,7-tetramethylnonane

2. Draw and label the four different Newman’s projection conformation of the structure from the indicated POV across the carbon labeled 1 to 2. Three conformations must be gauche, anti, and eclipsed (with the highest energy).

![Newman's Projection](image4.png)
3. Answer the following questions based on the chair conformation of the trans 1,3-dimethylcyclohexane and cis 1,3-dimethylcyclohexane.

![trans 1,3-dimethylcyclohexane]

![cis 1,3-dimethylcyclohexane]

trans 1,3- dimethylcyclohexane  cis 1,3- dimethylcyclohexane

a. Which chair is less stable and higher in energy? What interaction causes this?

b. What does the most unstable chair conformation look like? Hint: It is neither of the chairs shown.

4. Challenge question: Draw the two chair conformers of the cyclohexane structure below. One with the largest group in the axial position and the other in the equatorial position.