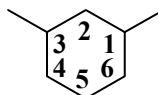


Additional Guidelines for Naming Cycloalkanes and Cycloalkenes

1. Cycloalkanes and cycloalkenes are named as for alkanes and alkenes except that they include the prefix 'cyclo' in the name.
2. The ring is numbered either clockwise or anticlockwise so that the substituents are assigned the lowest number possible.
3. For mono-substituted cycloalkanes, the site of the substituent is assumed to be C-1 and it is not included in the name.
4. For cycloalkenes, the site of the alkene is assumed to be C-1.
5. When the ring is a substituent on a long chain, it is named a cycloalkyl substituent. If there are other substituents on such a ring, it is treated in the same way as the branched substituents that were discussed earlier.

Examples

1. Give the IUPAC name for:

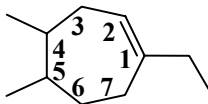
**STRATEGY/OBSERVATIONS**

When working with cyclic molecules, I suggest that you redraw the structure using the line angle representation, but you should number the carbons atoms on the ring, as is drawn above. Fill out the nomenclature template

	OBSERVATION	IMPLICATION
Parent Group and Site	cyclic alkane	cyclo....ane
Longest Carbon Chain/Ring	6-membered ring	cyclohexane
# C=C or C≡C bonds and Site	None	
Final Word		cyclohexane
Substituents and Sites	2 CH ₃ 's at C-1 & C-3	1,3-dimethyl
Alphabetizing substituents		1,3-dimethyl

SOLUTION Compound is 1,3-Dimethylcyclohexane

2. Give the IUPAC name for:



STRATEGY/OBSERVATIONS

When numbering a cycloalkene, select as C-1 the carbon of the double bond that will generate the lowest numbers for sites of the ring substituents. Remember, the other carbon of the double bond must be C-2. When naming the molecule, the site of the alkene will not be listed. Fill out the nomenclature template.

	OBSERVATION	IMPLICATION
Parent Group and Site	Cyclic alkene	cyclo...ene
Longest Carbon Chain/Ring	7 carbons	cycloheptene
# C=C or C≡C bonds and Site	alkene at C-1	cycloheptene (number not listed)
Final Word		cycloheptene
Substituents and Sites	C ₂ H ₅ at C-1 2 CH ₃ 's at C-3 & C-4	1-ethyl 3,4-dimethyl
Alphabetizing substituents		1-ethyl-3,4-dimethyl

SOLUTION Compound is 1-ethyl-3,4-dimethylcycloheptene

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V.A NAMING COMPOUNDS ALKYL CYCLOALKANES OR CYCLOALKYL ALKANES

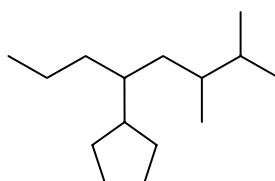
For compounds with a ring and a long, or a branched, alkyl chain, it is awkward to decide if the ring is a substituent on the alkyl chain or *vice versa*. The following guidelines are helpful.

Guidelines for Naming Cyclic Compounds With Extended Alkyl Groups (> 2 Carbons)

1. Name the compound as an alkyl cycloalkane/cycloalkene if:
 - a. The straight alkyl chain contains no more than 5 carbon atoms.
 - b. The branched alkyl chain has a specific designation, e.g., isopropyl.
2. Name the compound as a cycloalkylalkane if:
 - a. The straight alkyl chain is long (> 5 carbon atoms).
 - b. The branched alkyl chain does not have a specific IUPAC name, i.e., it is not isopropyl, isobutyl *sec*-butyl, *tert*-butyl or neopentyl.

Example

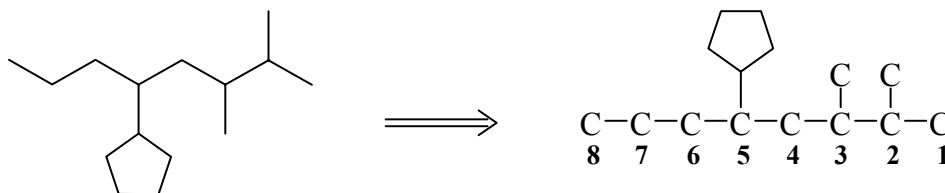
Give the IUPAC name for:



OBSERVATIONS/STRATEGY

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Redraw the structure.



The ring is attached to a large, branched alkyl chain; therefore, it is named a cycloalkyl alkane.

Fill out the nomenclature template

	OBSERVATION	IMPLICATION
Parent Group and Site	Alkane	-ane
Longest Carbon Chain/Ring	8 carbons	octane
# C=C or C≡C bonds and Site	None	octane
Final Word		octane
Substituents and Sites	2 CH ₃ 's at C-2 & C-3 5-Carbon ring at C-5	2,3-dimethyl 5-cyclopentyl
Alphabetizing substituents		5-cyclopentyl-2,3-dimethyl...

SOLUTION Compound is 5-cyclopentyl-2,3-dimethyloctane