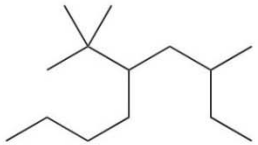
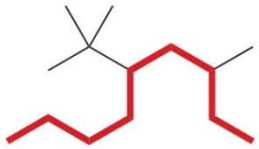
Give the IUPAC name for the following compound.



Solution

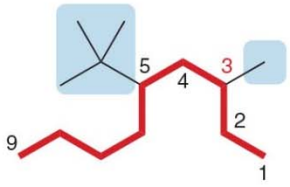
To help identify which carbons belong to the longest chain and which are substituents, box in or highlight the atoms of the long chain. Every other carbon atom then becomes a substituent that needs its own name as an alkyl group.

Step 1: Name the parent.



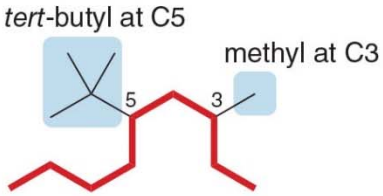
9 C's in the longest chain
nonane

Step 2: Number the chain.



first substituent at C3

Step 3: Name and number the substituents.



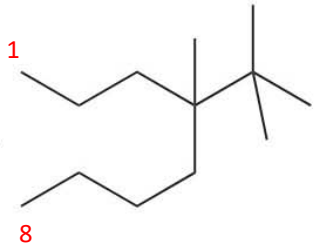
Step 4: Combine the parts.

- Alphabetize: the **b** of **butyl** before the **m** of **methyl**

Answer: 5-*tert*-butyl-3-methylnonane

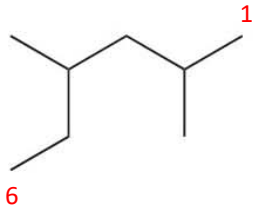
Give the IUPAC name for the following compounds.

a.



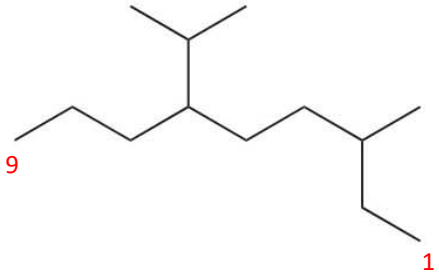
4-tert-butyl-4-methyloctane

b.



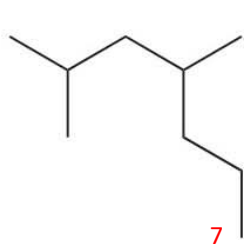
2,4-dimethylhexane

c.



6-isopropyl-3-methylnonane

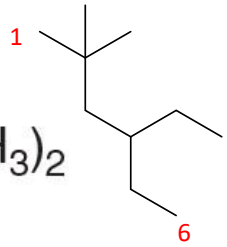
d.



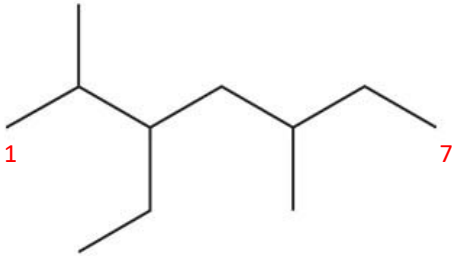
2,4-dimethylheptane

4-ethyl-2,2-dimethylhexane

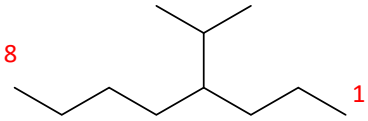
a. $(CH_3)_3CCH_2CH(CH_2CH_3)_2$



b.



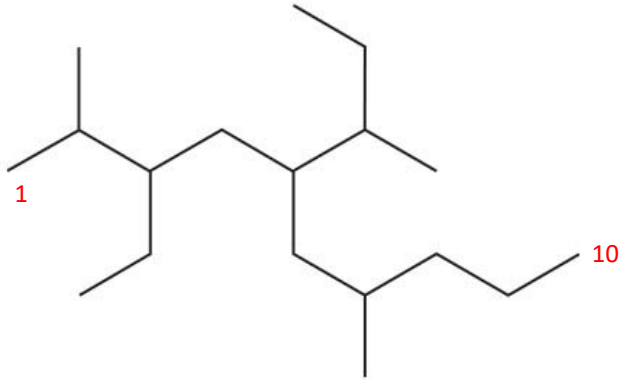
3-ethyl-2,5-dimethylheptane



4-isopropyloctane

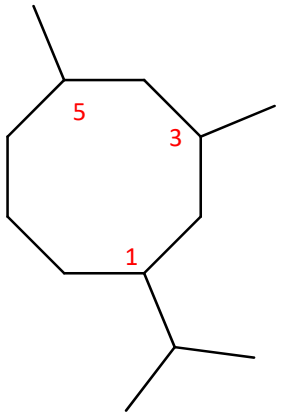
c. $CH_3(CH_2)_3CH(CH_2CH_2CH_3)CH(CH_3)_2$

d.

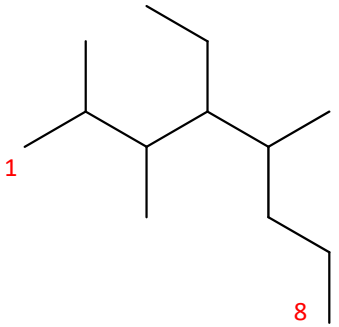


5-sec-butyl-3-ethyl-2,7-dimethyldecane

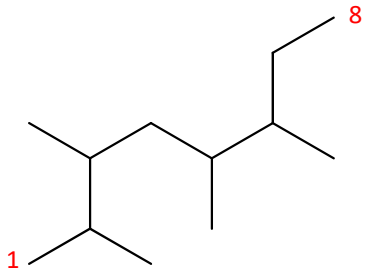
Give the IUPAC name for the following compounds.



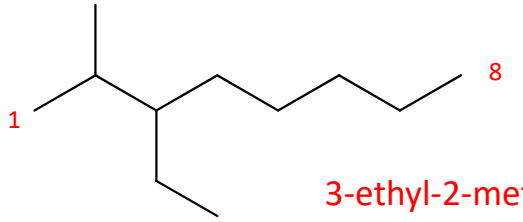
1-isopropyl-3,5-dimethylcycloctane



4-ethyl-2,3,5-trimethyloctane



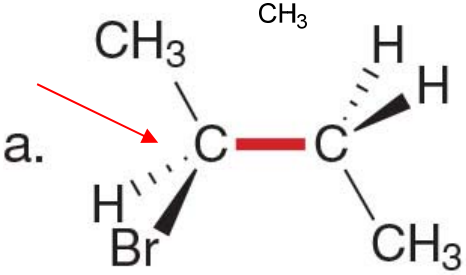
2,3,5,6-tetramethyloctane



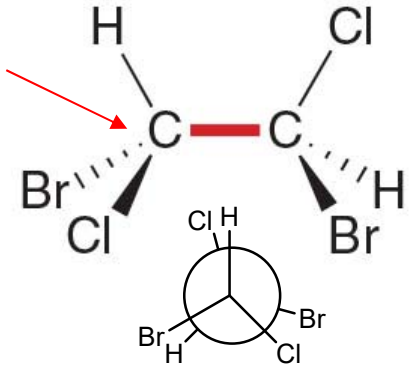
3-ethyl-2-methyloctane

Draw Newman projections

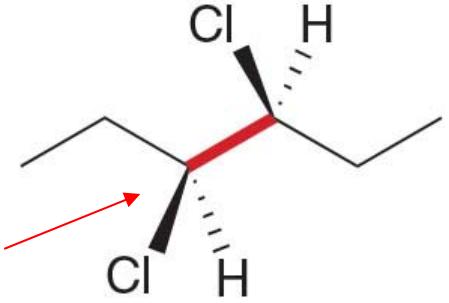
a.

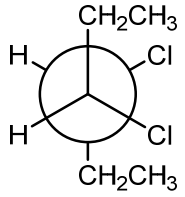


b.

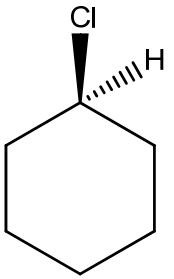


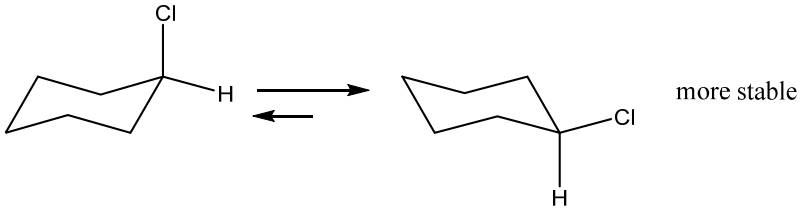
c.





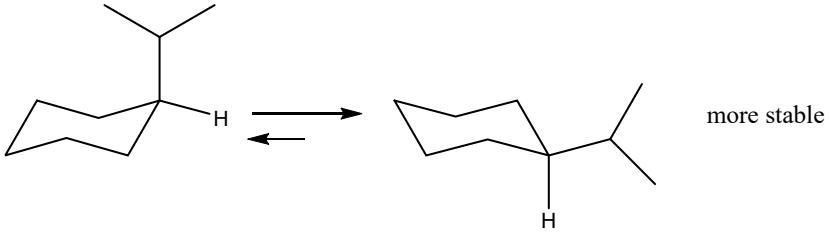
Draw the molecule in the two possible chair conformations showing the most stable one.



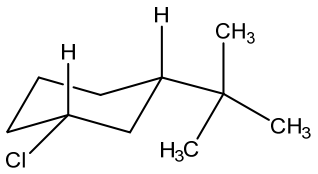


Draw the molecule in the two possible chair conformations showing the most stable one.

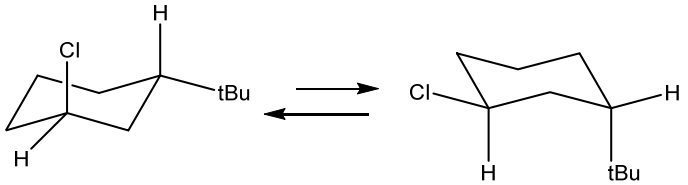
- *Isopropylcyclohexane*



- *1-tertbutyl-3-chlorocyclohexane (all possible isomers)*



cis isomer
essentially only diequatorial
at room temperature



trans isomer