

Organic Chemistry Review

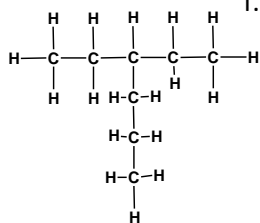
1. C_4H_{10} exists in the form of two structural isomers. Draw the structural formula and write the IUPAC name of each.

2. Draw the condensed straight-chain structures for heptane and nonane.

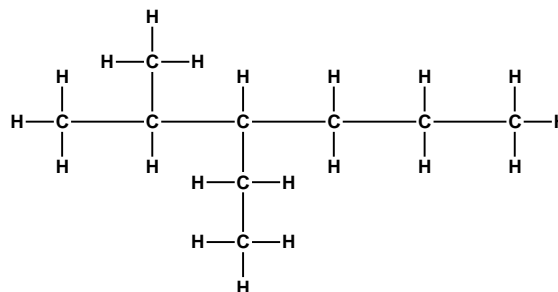
3. Match each name in a-d with the correct structure in e-h.

- a. 3-ethyl-2-methylhexane
- b. 3-ethyl-4-methylhexane
- c. 2,2-dimethylhexane
- d. 3-ethylhexane

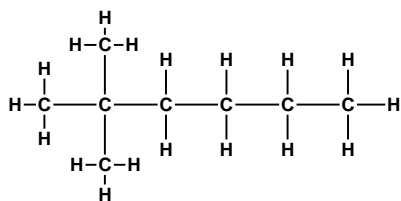
e.



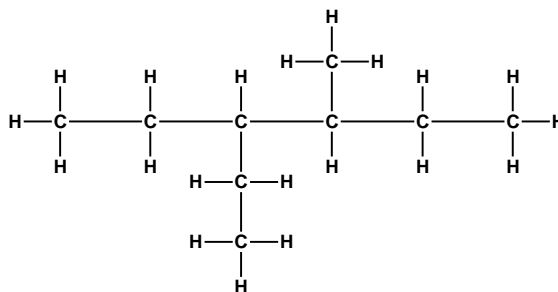
f.



g.

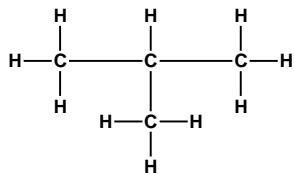


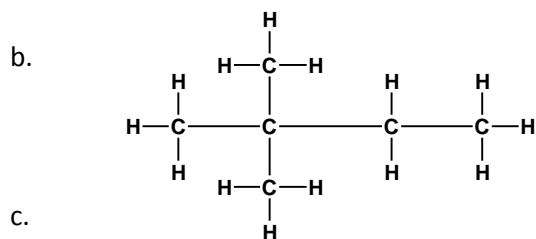
h.



4. Write the names of the following alkanes:

a.





5. How many hydrogen atoms would be in a molecule of an alkane containing 15 carbon atoms? 50 carbon atoms?

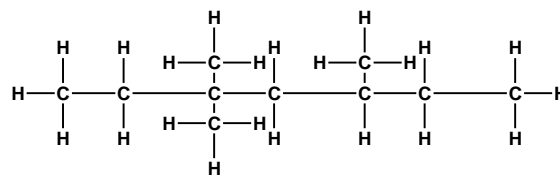
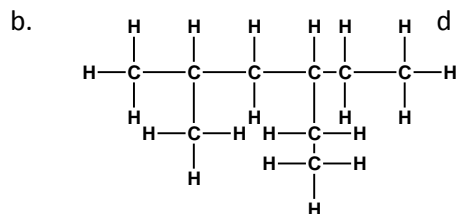
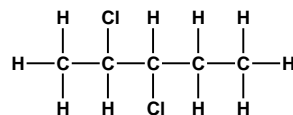
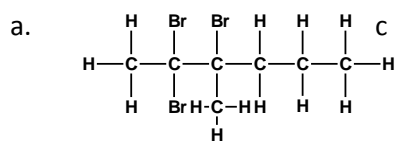
6. Draw the condensed structural formulas of the following compounds:

a. 2-methylbutane

b. 3,3-dichlorohexane

c. 4-ethyl-2,3,4-trimethyldecane

7. Write the correct name for each of the following structures:



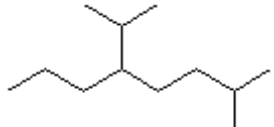
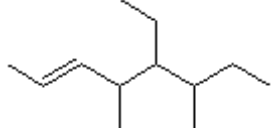

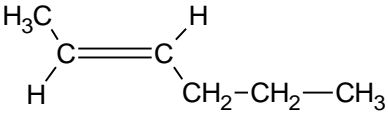
Alkanes, Alkenes, Alkynes and Cyclic Hydrocarbons

Name or draw the following compounds. Insert other functional groups to change the compound (and therefore, its name).

	Chemical structure	IUPAC Name
1	$\begin{array}{c} \text{Cl} \\ \\ \text{H}_3\text{C}-\text{CH}_2-\text{CH}-\text{CH}_3 \end{array}$	
2	$\begin{array}{c} \text{CH}_3 \\ \\ \text{H}_3\text{C}-\text{CH}-\text{CH}_2-\text{HC}-\text{CH}_3 \\ \\ \text{CH}_2 \\ \\ \text{CH}_3 \end{array}$	
3	$\begin{array}{c} \text{Br} \qquad \text{Br} \qquad \text{Cl} \\ \qquad \qquad \\ \text{H}_3\text{C}-\text{CH}-\text{CH}_2-\text{CH}-\text{CH}-\text{C}-\text{CH}_3 \\ \qquad \\ \text{CH}_3 \qquad \text{Cl} \end{array}$	
4	$\begin{array}{c} \text{CH}_3 \\ \\ \text{H}_3\text{C}-\text{C}-\text{CH}_2-\text{CH}-\text{CH}_2-\text{CH}_2 \\ \qquad \qquad \\ \text{CH}_2 \qquad \text{NH}_2 \qquad \text{NO}_2 \\ \\ \text{CH}_3 \end{array}$	
5	$\begin{array}{c} \text{CH}_3 \\ \\ \text{H}_3\text{C}-\text{CH}-\text{CH}_2-\text{C}-\text{CH}_2-\text{CH}_3 \\ \qquad \\ \text{CH}_3 \qquad \text{CH}_3 \end{array}$	
6	$\begin{array}{c} \text{CH}_3 \\ \\ \text{HC}-\text{CH}_2-\text{CH}-\text{CH}-\text{CH}_3 \\ \qquad \qquad \\ \text{CH}_2 \qquad \text{Cl} \qquad \text{Cl} \\ \\ \text{Cl}-\text{CH} \\ \\ \text{CH}_3 \end{array}$	
7	$\begin{array}{c} \text{NH}_2 \qquad \text{NH}_2 \\ \qquad \\ \text{H}_3\text{C}-\text{C}-\text{CH}_2-\text{C}-\text{CH}_3 \\ \qquad \\ \text{NO}_2 \qquad \text{NO}_2 \end{array}$	
8	$\begin{array}{c} \text{Cl} \qquad \text{Cl} \qquad \text{Cl} \\ \qquad \qquad \\ \text{Cl}-\text{C}-\text{CH}_2-\text{C}-\text{CH}_2-\text{C}-\text{CH}_3 \\ \qquad \qquad \\ \text{Cl} \qquad \text{Cl} \qquad \text{Cl} \end{array}$	
9	$\begin{array}{c} \text{CH}_3 \\ \\ \text{H}_3\text{C}-\text{C}-\text{CH}_2-\text{CH}-\text{CH}_3 \\ \\ \text{CH}_3 \end{array}$	

10	$\begin{array}{c} \text{Br} \\ \\ \text{H}_3\text{C}-\text{CH}_2-\text{C}-\text{CH}_2-\text{CH}_3 \\ \\ \text{Cl} \end{array}$	
11	$\begin{array}{c} \text{NO}_2 \quad \text{Br} \\ \quad \\ \text{H}_3\text{C}-\text{CH}-\text{CH}_2-\text{CH}_2 \end{array}$	
12		2,3-dichloropentane
13		3-bromo-2-methylheptane
14		<i>trans</i> -1,2-dichloropropene
15		4,4-diamino-2,3,6-trichlorooctane
16		2,2,3,3,4-pentachloropentane
17	$\text{H}_3\text{C}-\text{CH}_2-\text{CH}=\text{CH}-\text{CH}_2-\text{CH}_3$	
18	$\begin{array}{c} \text{CH}_2 \\ \\ \text{H}_3\text{C}-\text{CH}_2-\text{C}-\text{CH}_2-\text{CH}_2-\text{CH}_3 \end{array}$	
19	$\begin{array}{c} \text{Cl} \\ \\ \text{H}_3\text{C}-\text{CH}-\text{CH}-\text{CH}=\text{CH}-\text{CH}_3 \\ \\ \text{NO}_2 \end{array}$	
20	$\begin{array}{c} \text{Cl} \\ \\ \text{H}_3\text{C}-\text{CH}_2-\text{CH}-\text{CH}-\text{CH}-\text{CH}_3 \\ \quad \\ \text{Cl} \quad \text{Cl} \end{array}$	

21	$\begin{array}{ccccccc} & \text{CH}_3 & & \text{Br} & \text{Br} & & \\ & & & & & & \\ \text{H}_3\text{C} & -\text{C} & -\text{CH}_2 & -\text{C} & =\text{C} & -\text{CH}_3 \\ & & & & & & \\ & \text{CH}_3 & & & & & \end{array}$	
22	$\begin{array}{ccccccc} & & & \text{CH}_3 & & & \\ & & & & & & \\ \text{Cl} & & & \text{CH} & & & \\ & & & & & & \\ \text{HC} & -\text{CH}_2 & -\text{C} & -\text{CH}_3 \\ & & & & & & \\ \text{CH}_3 & & & & & & \end{array}$	
23	$\begin{array}{ccccccccccc} & \text{CH}_3 & & \text{CH}_3 & & \text{Cl} & \text{Cl} & & & & \\ & & & & & & & & & & \\ \text{H}_3\text{C} & -\text{C} & -\text{C} & -\text{CH}_2 & -\text{C} & =\text{C} & -\text{CH}_2 & -\text{CH}_3 \\ & & & & & & & & & & \\ & \text{CH}_3 & \text{CH}_3 & & & & & & & & \end{array}$	
24		5-amino-3-chloro-1-pentene
26		4-chloro-2,2-dinitro-3-heptene
27		<i>trans</i> -3-octene
28	$\begin{array}{ccccccc} & & & \text{Cl} & & & \\ & & & & & & \\ \text{H}_3\text{C} & -\text{C} & \equiv\text{C} & -\text{C} & -\text{CH}_3 \\ & & & & & & \\ & & & \text{Cl} & & & \end{array}$	
29	$\begin{array}{ccccccc} & & & \text{Br} & \text{Br} & & \\ & & & & & & \\ \text{HC} & \equiv\text{C} & -\text{CH} & -\text{CH} & -\text{CH}_2 & -\text{CH}_3 \\ & & & & & & \end{array}$	
30	$\text{H}_3\text{C} - \text{C} \equiv \text{C} - \text{CH}_3$	
31		5,5-dimethyl-2-hexyne
32		5-amino-3-heptyne
33		a. pentane

45	 (C ₁₂ H ₂₆)	(recall that in line diagrams, lines represent carbon-carbon bonds; this contains isopropyl)
46	 (C ₁₂ H ₂₄)	
47	 (C ₉ H ₁₆)	
48		1,3-diaminopropane (line diagram)
49		<i>trans</i> -5-ethyl-4,5-dimethyl-2-heptene (line diagram)
50	 H ₃ C C=C H CH ₂ -CH ₂ -CH ₃	(indicate if it is <i>cis</i> or <i>trans</i> isomer)

please remember to try and add functional groups to the above compounds
Add a -COOH group or make your own amine! It's easy to do...you could try with a partner

2. Make a chart like the following on a separate piece of paper. Fill it in with each organic compound's name.

Organic Compound	General Structure	Suffix/Prefix	Sample Names

3. What is the name for a pair of molecules with the same molecular and structural formulas, but that are non-superimposable mirror images?

5. Draw structural diagrams of all C₆H₁₄ isomers. Name these structures.

9. Draw the resulting polymer from the following monomers. What type of polymerization occurs when they link?

