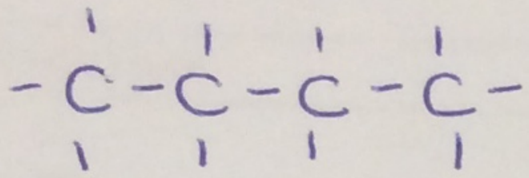
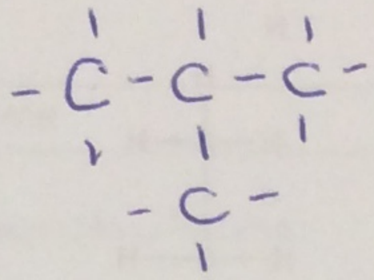
Organic Chemistry Review

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



butane



2-methylpropane

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

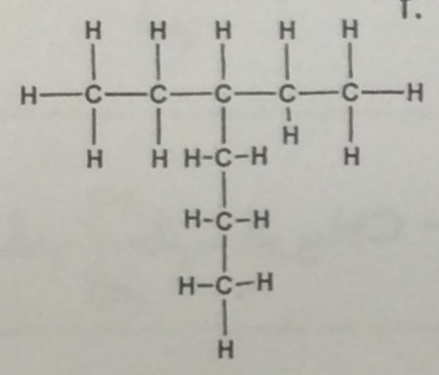
7C: $CH_3CH_2CH_2CH_2CH_2CH_2CH_3$

9C: $CH_3CH_2CH_2CH_2CH_2CH_2CH_2CH_2CH_3$

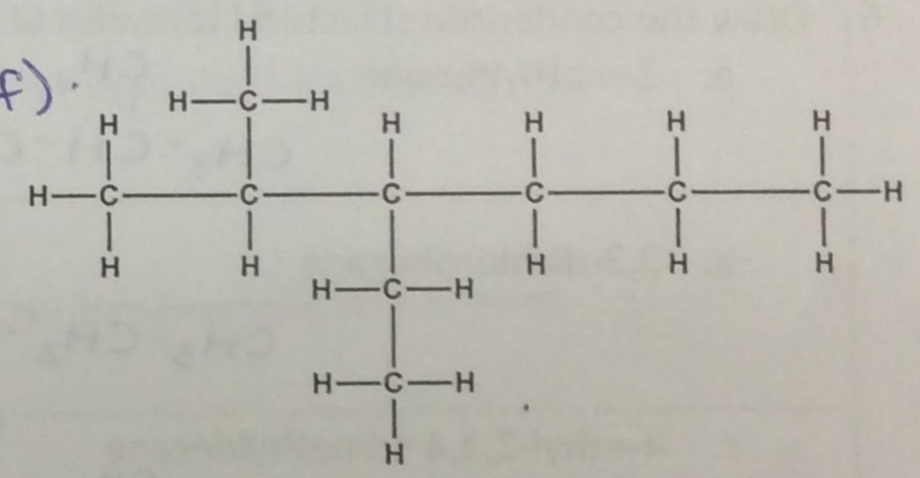
3. Match each name in a-d with the correct structure in e-h.

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

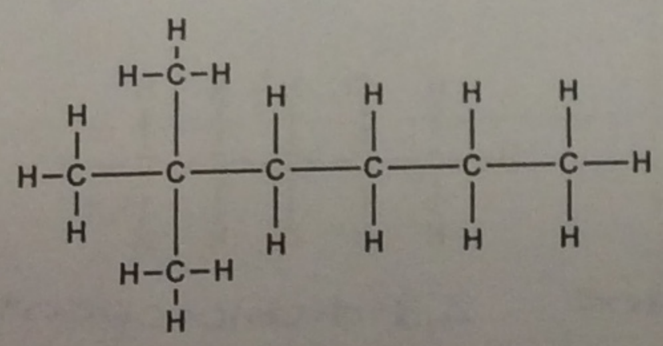
e.



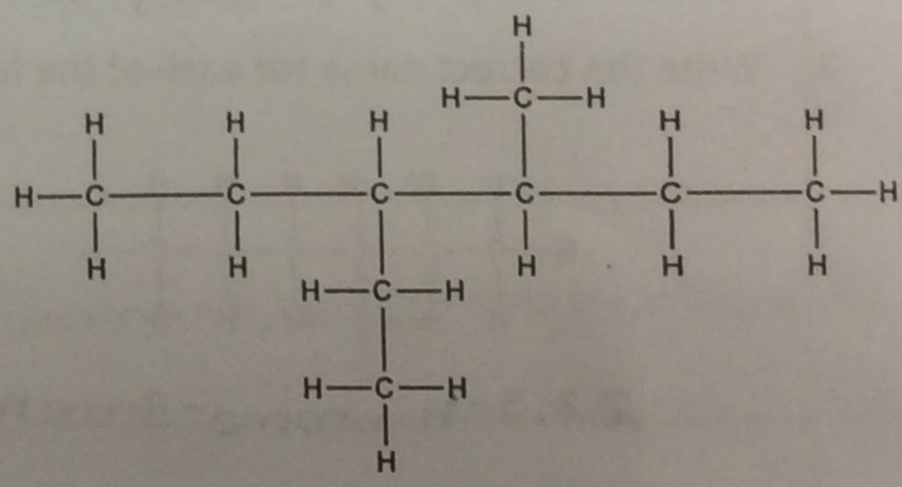
f)



g.

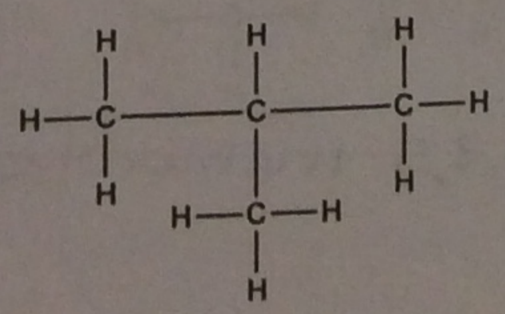


h.



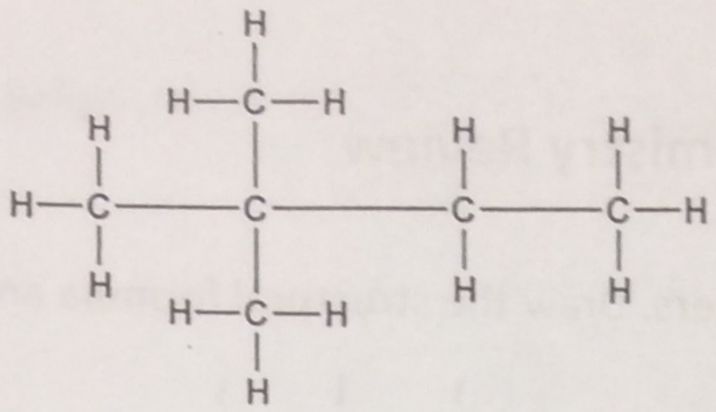
4. Write the names of the following alkanes:

a.



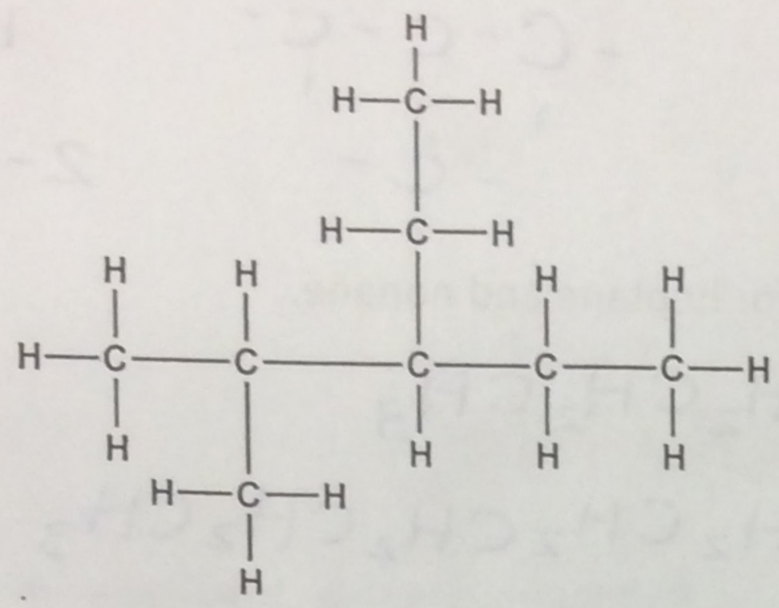
2-methylpropane

b.



2,2-dimethylbutane

c.



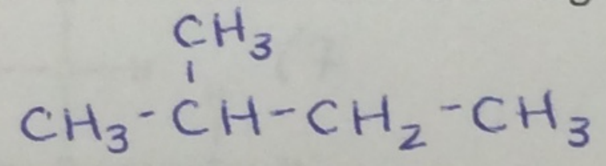
3-ethyl-2-methylpentane

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

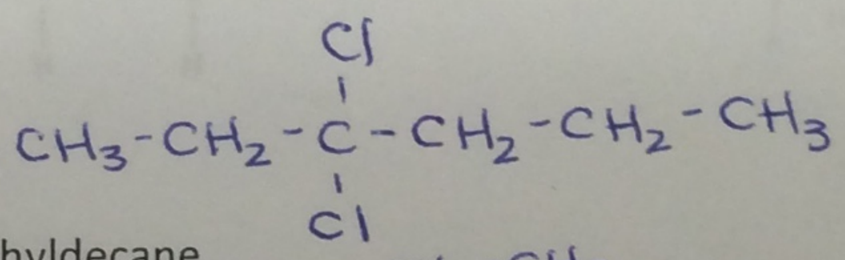
C_nH_{2n+2} so... $C_{15}H_{32}$ $C_{50}H_{102}$

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

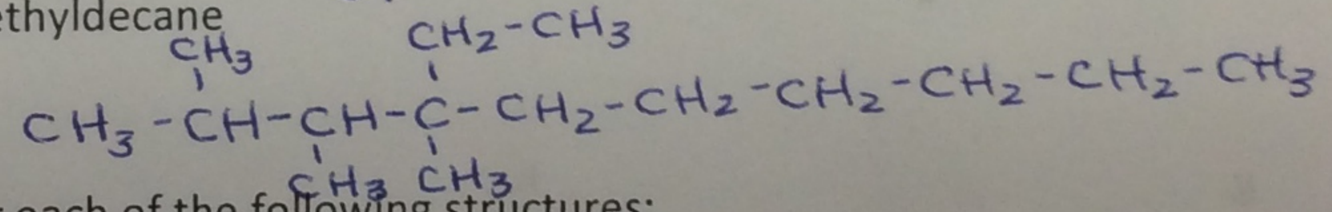
a. 2-methylbutane



b. 3,3-dichlorohexane

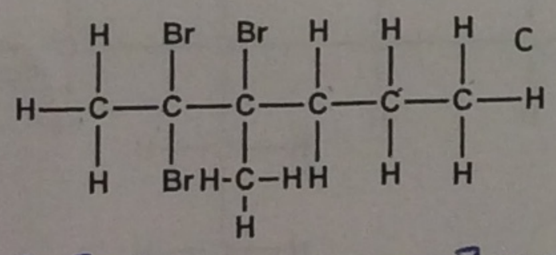


c. 4-ethyl-2,3,4-trimethyldecane

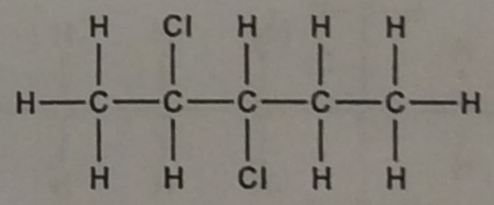


7. Write the correct name for each of the following structures:

a.

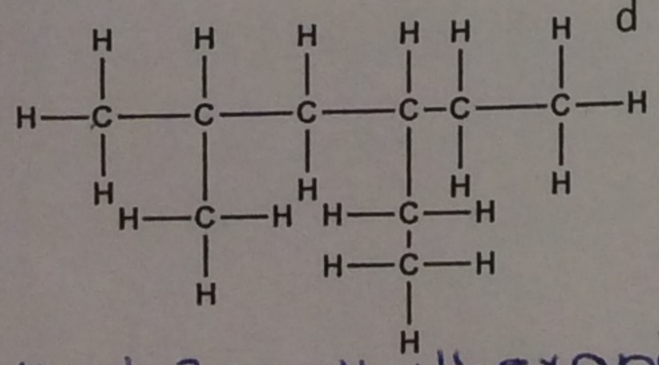


2,2,3-tribromo-3-methylhexane

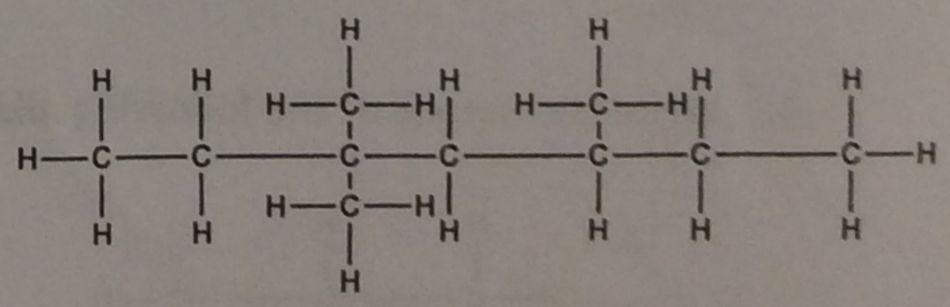


2,3-dichloropentane

b.



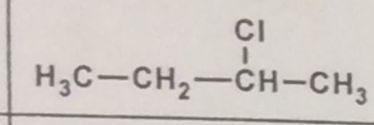
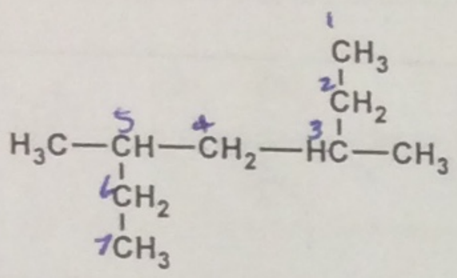
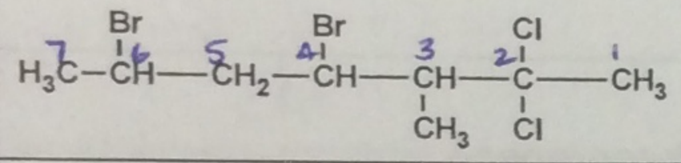
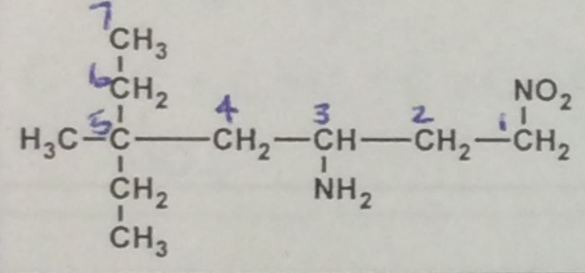
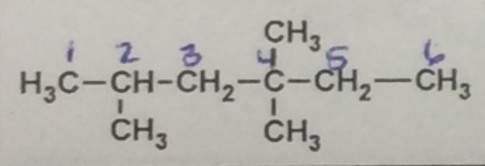
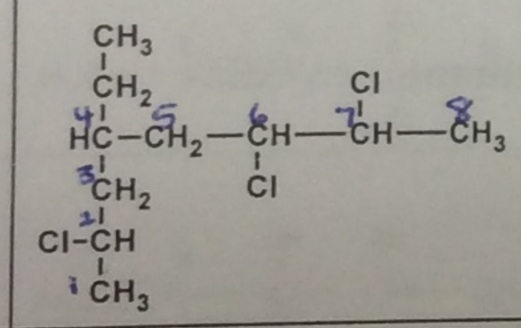
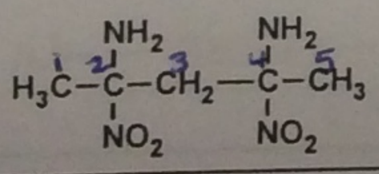
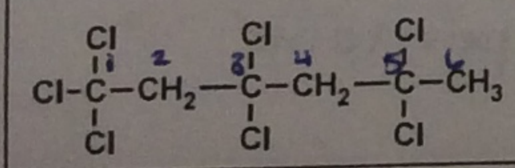
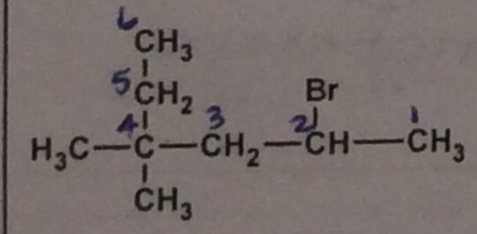
4-ethyl-2-methylhexane

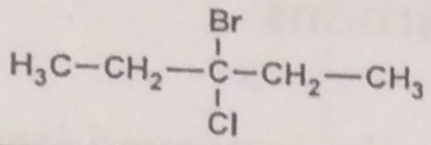
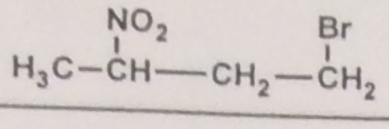
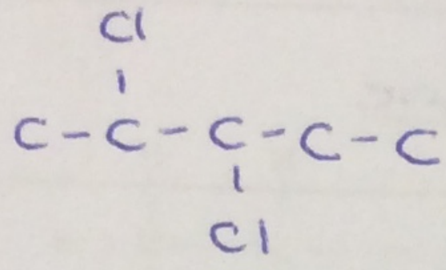
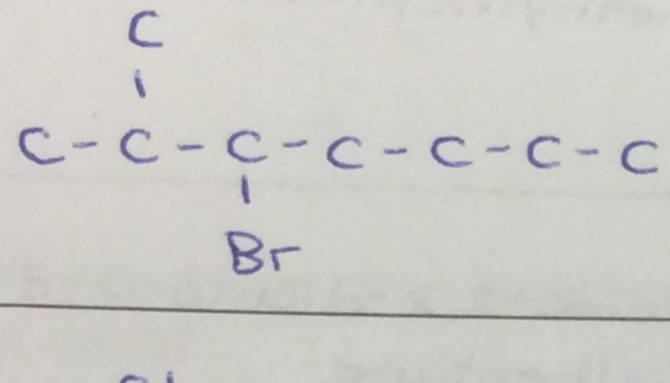
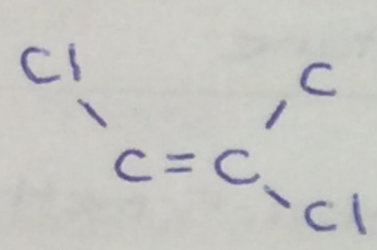
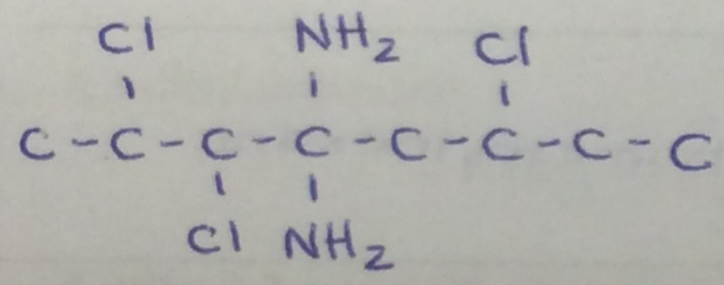
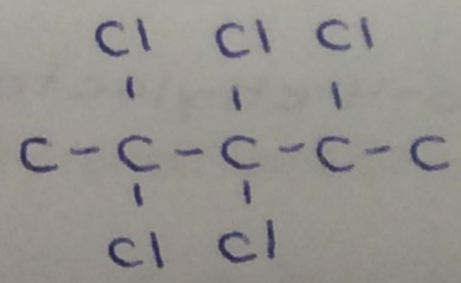
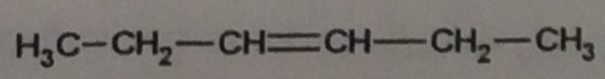
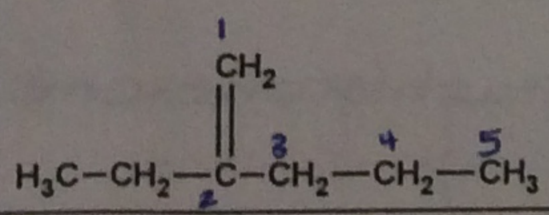
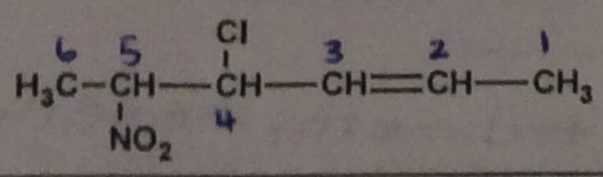
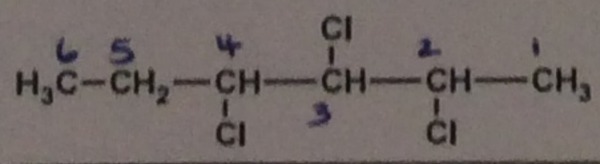


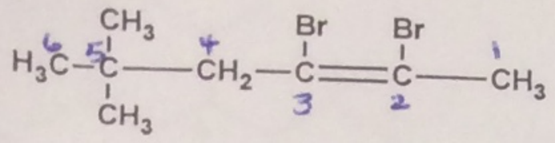
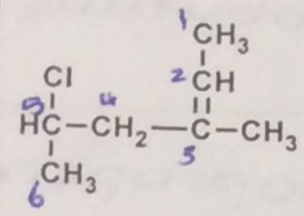
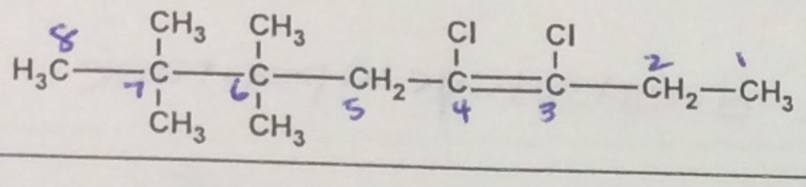
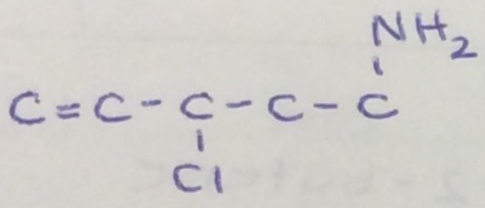
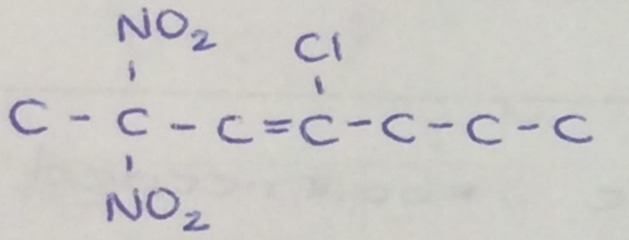
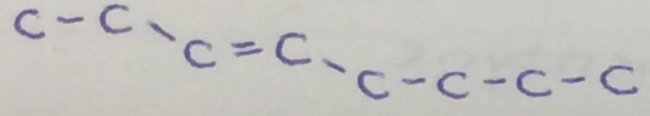
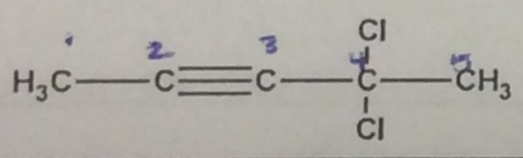
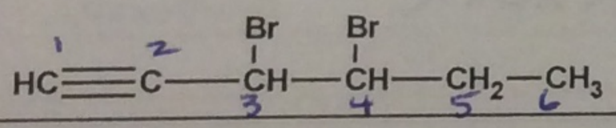
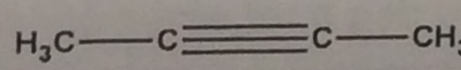
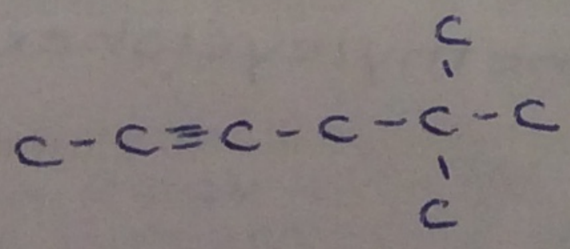
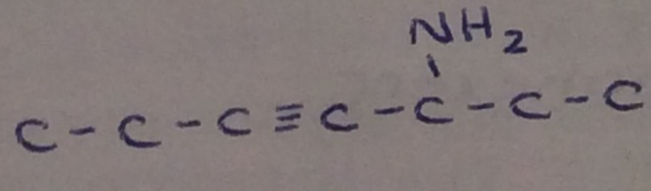
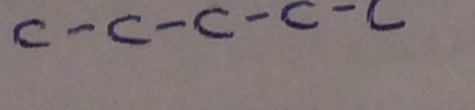
3,3,5-trichloroheptane

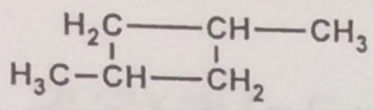
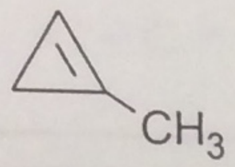
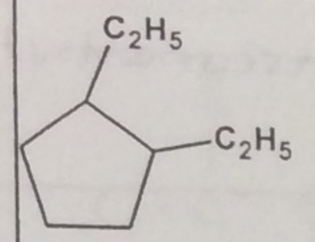
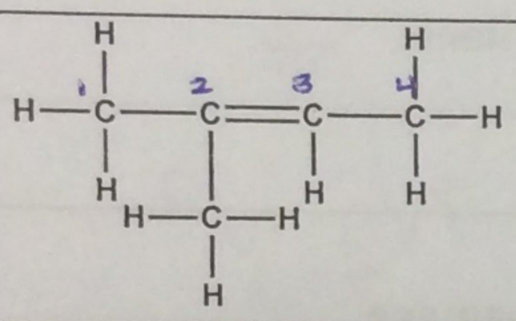
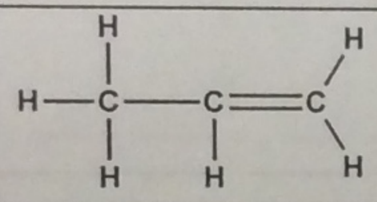
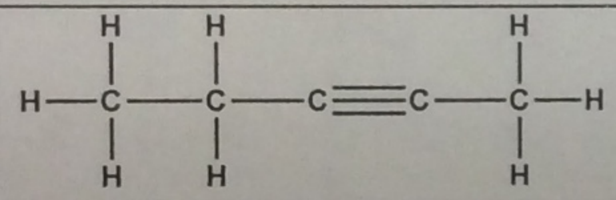
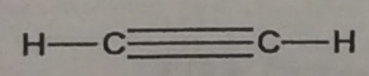
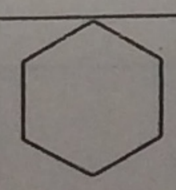
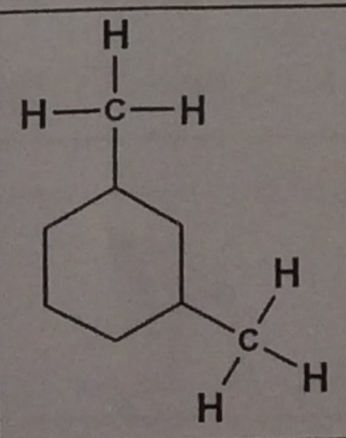
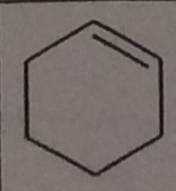
Alkanes, Alkenes, Alkynes and Cyclic Hydrocarbons

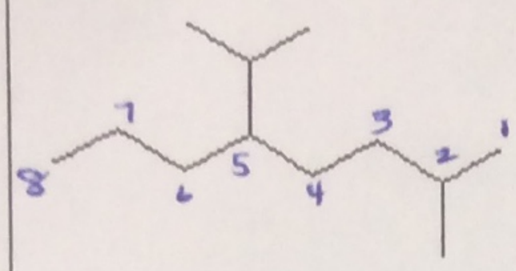
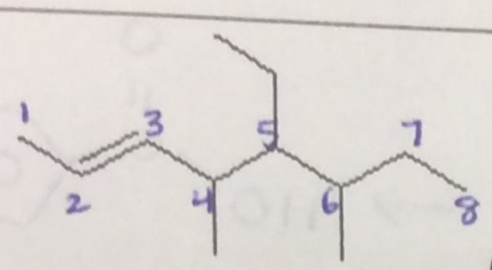
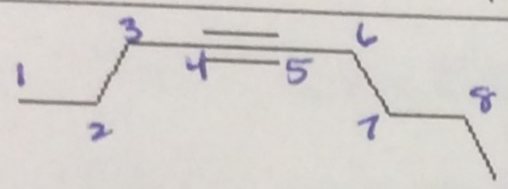
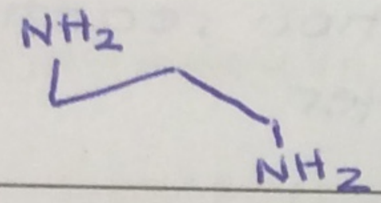
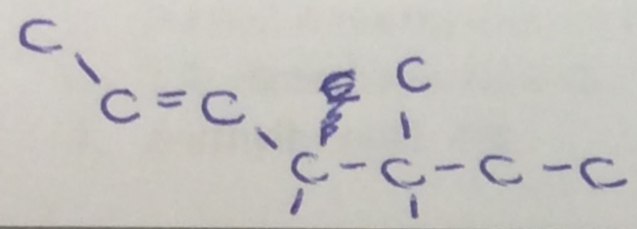
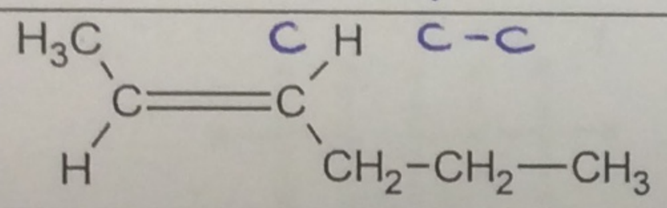
Name or draw the following compounds. Insert other functional groups to change the compound (and therefore, its name).

	Chemical structure	IUPAC Name
1		2-chlorobutane
2		3,5-dimethylheptane
3		4,6-dibromo-2,2-dichloro-3-methylheptane
4		3-amino-5-ethyl-5-methyl-1-nitroheptane
5		2,4,4-trimethylhexane
6		2,6,7-trichloro-4-ethyloctane
7		2,4-diamino-2,4-dinitropentane.
8		1,1,1,3,3,5,5-heptachlorohexane
9		2-bromo-4,4-dimethylhexane

10		3-bromo-3-chloropentene
11		1-bromo-3-nitrobutane
12		2,3-dichloropentane
13		3-bromo-2-methylheptane
14		*trans*-1,2-dichloropropene
15		4,4-diamino-2,3,6-trichlorooctane
16		2,2,3,3,4-pentachloropentane
17		3-hexene
18		2-methyl-1-pentene
19		4-chloro-5-nitro-2-hexene
20		2,3,4-trichlorohexane

21		2,3-dibromo-5,5-dimethyl-2-hexene
22		5-chloro-3-methyl-2-hexene
23		3,4-dichloro-6,6,7,7-tetramethyl-3-octene
24		5-amino-3-chloro-1-pentene
26		4-chloro-2,2-dinitro-3-heptene
27		*trans*-3-octene
28		4,4-dichloro-2-pentyne
29		3,4-dibromo-1-hexyne
30		2-butyne
31		5,5-dimethyl-2-hexyne
32		5-amino-3-heptyne
33		a. pentane

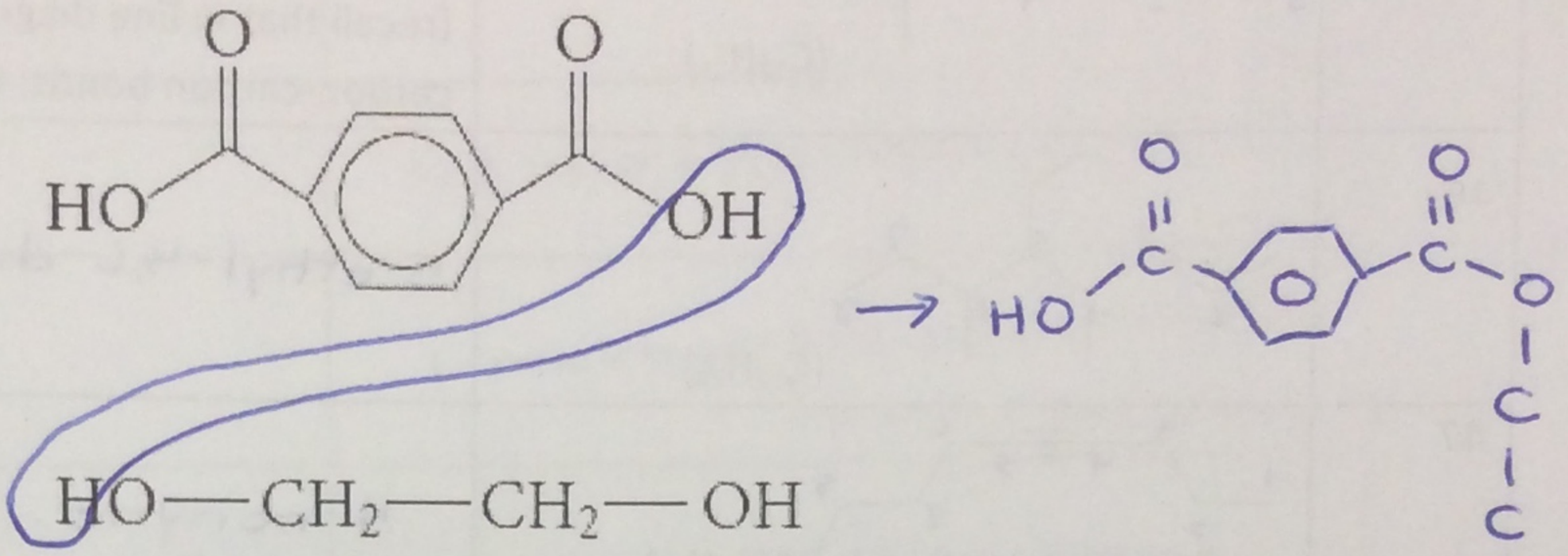
	C-C=C-C-C C≡C-C-C-C	b. 2-pentene c. 1-pentyne
34		1,3-dimethylcyclobutane
35		1-methyl-1-cyclopropene ↑* not necessary
36		1,2-diethylcyclopentane
37		2-methyl-2-butene
38		propene *no # needed
40		2-pentyne
41		ethyne
42		cyclohexane
43		1,3-dimethylcyclohexane
44	 (C_6H_{10})	cyclohexene

45	 ($C_{12}H_{26}$)	5-isopropyl-2-methyloctane (recall that in line diagrams, lines represent carbon-carbon bonds; this contains isopropyl)
46	 ($C_{12}H_{24}$)	5-ethyl-4,6-dimethyl-2-octene
47	 $_9(C_9H_{16})$	4-nonyne.
48		1,3-diaminopropane (line diagram)
49		*trans*-5-ethyl-4,5-dimethyl-2-heptene (line diagram)
50		cis-2-hexene (indicate if it is *cis or trans* 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

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



* water eliminated... ∴ condensation reaction
→ forms a polyester