

Name \_\_\_\_\_

Period \_\_\_\_\_

## Naming Alkanes – Worksheet #1

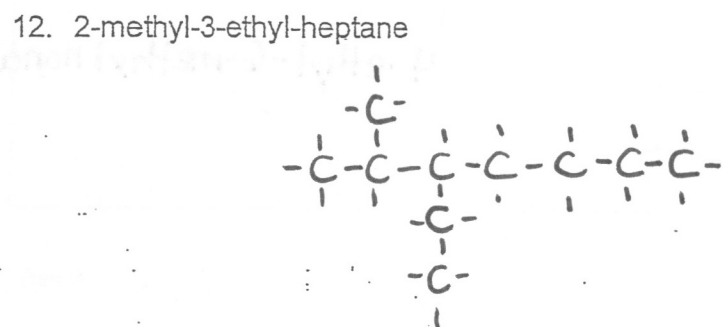
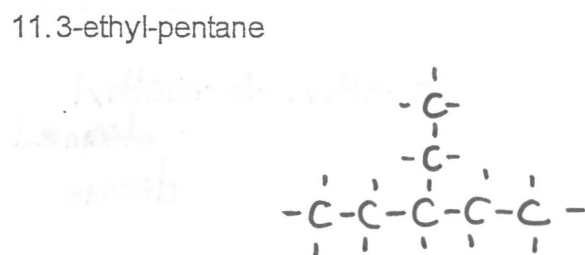
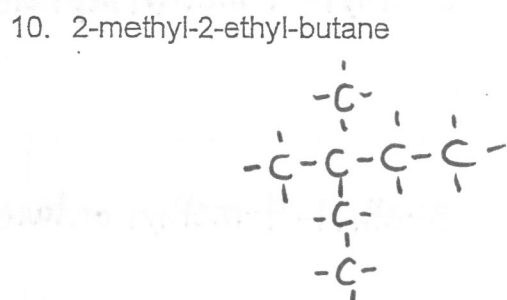
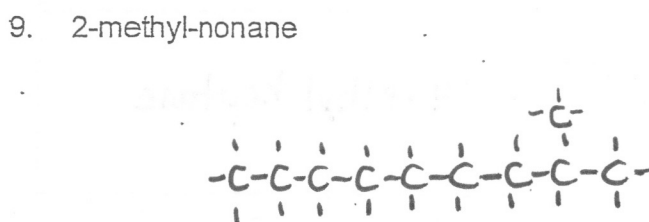
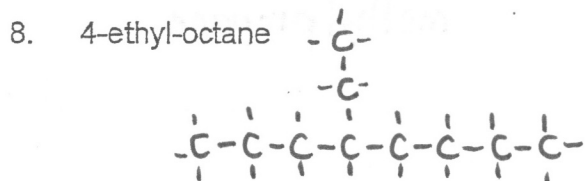
Name the following branched alkanes:

1.	$\begin{array}{c} \text{H}_3\text{C}-\text{CH}-\text{CH}_3 \\   \\ \text{CH}_3 \end{array}$	methyl propane
2.	$\begin{array}{c} \text{H}_3\text{C}-\text{CH}-\text{CH}_3 \\   \\ \text{CH}_2-\text{CH}_3 \end{array}$	2-methyl butane
3.	$\begin{array}{c} \text{H}_3\text{C}-\text{CH}_2-\text{CH}_2-\text{CH}-\text{CH}_2-\text{CH}_2-\text{CH}_3 \\   \\ \text{CH}_2-\text{CH}_3 \end{array}$	4-ethyl heptane
4.	$\begin{array}{c} \text{H}_3\text{C}-\text{CH}_2-\text{CH}_2-\text{CH}-\text{CH}-\text{CH}_2-\text{CH}_3 \\   \qquad   \\ \text{CH}_3 \qquad \text{CH}_2-\text{CH}_3 \end{array}$	3-ethyl-4-methyl heptane
5.	$\begin{array}{c} \text{H}_3\text{C}-\text{CH}_2-\text{CH}-\text{CH}_2-\text{CH}-\text{CH}_2-\text{CH}_3 \\   \qquad   \\ \text{CH}_3 \qquad \text{CH}_2-\text{CH}_2-\text{CH}_3 \end{array}$	3-ethyl-4-methyl octane
6.	$\begin{array}{c} \text{H}_3\text{C}-\text{CH}_2-\text{CH}_2-\text{CH}_2-\text{CH}_2 \\   \\ \text{H}_3\text{C}-\text{CH}_2-\text{CH}_2-\text{CH}_2-\text{C}-\text{CH}_2-\text{CH}_3 \\   \\ \text{CH}_3 \end{array}$	5-ethyl-5-methyl <del>decane</del> decane
7.	$\begin{array}{c} \text{CH}_2-\text{CH}_2-\text{CH}_3 \\   \\ \text{H}_2\text{C}-\text{CH}-\text{CH}_2-\text{CH}-\text{CH}_3 \\   \qquad   \\ \text{CH}_3 \qquad \text{CH}_2-\text{CH}_2-\text{CH}_3 \end{array}$	4-ethyl-6-methyl nonane

(over)

Draw structural formulas for the following molecules. Remember the following:

- Carbons on the end of a chain are attached to three hydrogens
- Carbons in the middle of a chain are attached to two hydrogens
- Carbons that have one branch attached are also attached to one hydrogen
- Carbons that have two branches attached are not attached to any hydrogens.



Name \_\_\_\_\_

Period \_\_\_\_\_

## Naming Alkanes – Worksheet #2

Name the following branched alkanes:

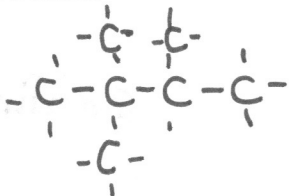
1.	$  \begin{array}{ccccccc}  & & & & \text{CH}_2 & \text{---} & \text{CH}_2 & \text{---} & \text{CH}_3 \\  & & & &   & & & & \\  \text{H}_3\text{C} & \text{---} & \text{CH}_2 & \text{---} & \text{CH} & \text{---} & \text{CH}_2 & \text{---} & \text{CH} & \text{---} & \text{CH}_2 & \text{---} & \text{CH}_2 & \text{---} & \text{CH}_3 \\  & & & &   & & & & & & & & & & \\  & & & & \text{CH}_3 & & & & & & & & & &   \end{array}  $	3-methyl-5-propyl octane
2.	$  \begin{array}{ccccccc}  & & & & \text{CH}_3 & & & & & & & & & & \\  & & & &   & & & & & & & & & & \\  \text{H}_3\text{C} & \text{---} & \text{CH}_2 & \text{---} & \text{C} & \text{---} & \text{CH}_2 & \text{---} & \text{CH} & \text{---} & \text{CH}_2 & \text{---} & \text{CH}_3 \\  & & & &   & & & &   & & & & & & \\  & & & & \text{CH}_3 & & & & \text{CH}_3 & & & & & &   \end{array}  $	3,3,5-trimethyl heptane
3.	$  \begin{array}{ccccccc}  & & & & \text{CH}_3 & & & & & & & & & & \\  & & & &   & & & & & & & & & & \\  \text{H}_3\text{C} & \text{---} & \text{CH}_2 & \text{---} & \text{C} & \text{---} & \text{CH}_3 \\  & & & &   & & & & & & & & & & \\  & & & & \text{CH}_3 & & & & & & & & & &   \end{array}  $	2,2-dimethyl butane
4.	$  \begin{array}{ccccccc}  & & & & \text{CH}_3 & & & & & & & & & & \\  & & & &   & & & & & & & & & & \\  \text{CH}_3 & \text{---} & \text{C} & \text{---} & \text{CH}_3 \\  & & & &   & & & & & & & & & & \\  & & & & \text{CH}_3 & & & & & & & & & &   \end{array}  $	dimethyl propane
5.	$  \begin{array}{ccccccc}  & & & & \text{CH}_2 & \text{---} & \text{CH}_3 \\  & & & &   & & & & & & & & & & \\  \text{H}_3\text{C} & \text{---} & \text{CH}_2 & \text{---} & \text{C} & \text{---} & \text{CH}_2 & \text{---} & \text{CH}_3 \\  & & & &   & & & & & & & & & & \\  & & & & \text{CH}_2 & \text{---} & \text{CH}_3 & & & & & & & &   \end{array}  $	3,3-diethyl pentane

(over)

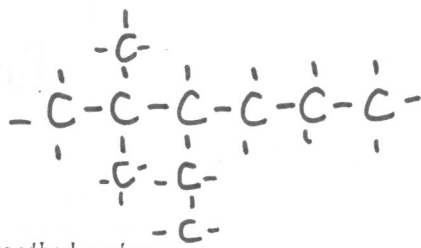
6.	$\begin{array}{c} \text{CH}_3 \\   \\ \text{H}_3\text{C}-\text{CH}_2-\text{C}-\text{CH}_2-\text{CH}_3 \\   \\ \text{CH}_2-\text{CH}_3 \end{array}$	2-ethyl-2-methylpentane
7.	$\begin{array}{cccccccc} & & \text{CH}_3 & & \text{CH}_3 & & & \\ & &   & &   & & & \\ \text{H}_3\text{C} & -\text{CH} & -\text{CH} & -\text{CH} & -\text{CH} & -\text{CH} & -\text{CH}_2 & -\text{CH}_3 \\ &   & &   & &   & & \\ & \text{CH}_3 & & \text{CH}_3 & & \text{CH}_3 & & \end{array}$	1,3,4,5-pentamethyloctane

Draw structural formulas for the following molecules:

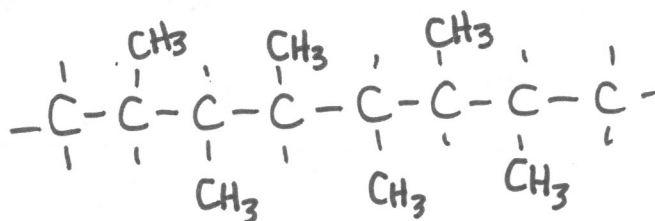
8. 2,2,3-trimethyl-butane



9. 3-ethyl-2,2-dimethyl-hexane



10. 2,3,4,5,6,7-hexamethyl-octane

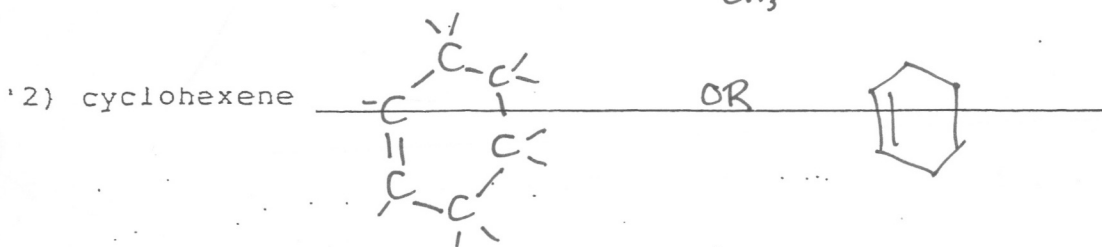
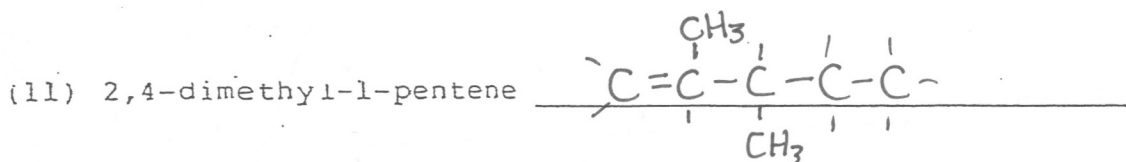
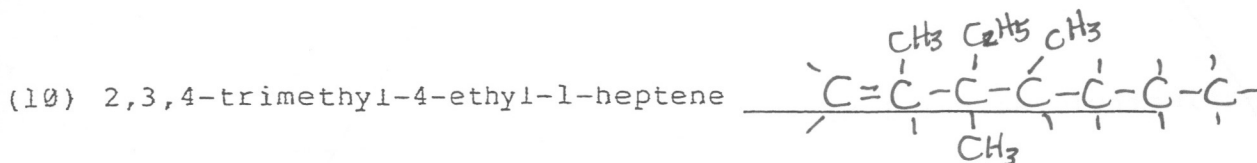
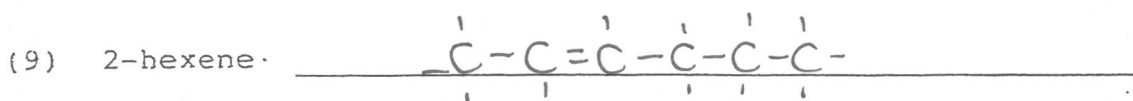
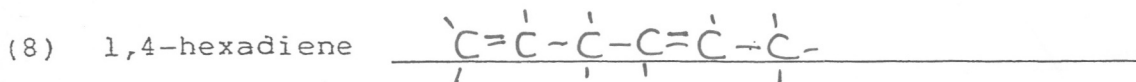
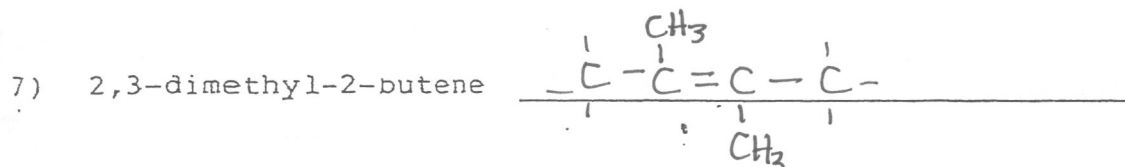
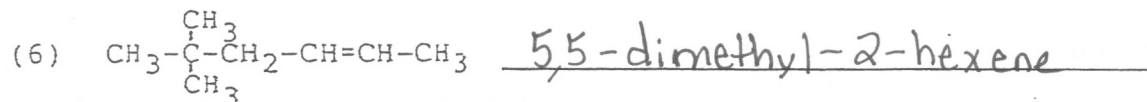
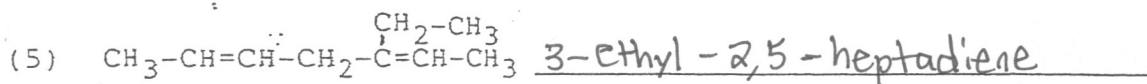
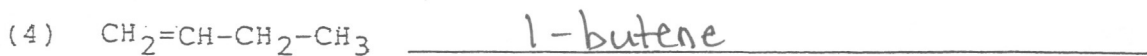
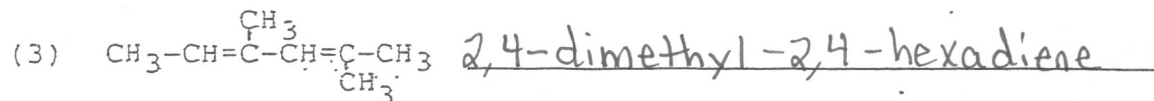
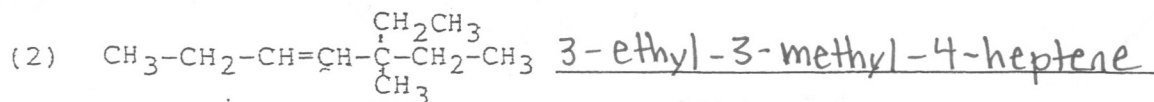
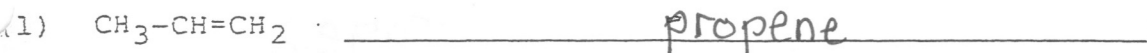


ALKANES I

- (1)  $\text{CH}_3\text{-CH}_2\text{-CH}_3$  propane
- (2)  $\begin{array}{c} \text{CH}_3 \\ | \\ \text{CH}_3\text{-CH-CH-CH}_3 \\ | \\ \text{CH}_2 \\ | \\ \text{CH}_3 \end{array}$  2-ethyl pentane
- (3)  $\begin{array}{c} \text{CH}_3 \\ | \\ \text{CH}_3\text{-CH-CH-CH-CH}_3 \\ | \quad | \\ \text{CH}_3 \quad \text{CH}_3 \end{array}$  2,3,4-trimethyl pentane
- (4)  $\begin{array}{c} \text{CH}_3\text{-CH-CH}_3 \\ | \\ \text{CH}_2 \\ | \\ \text{CH}_3\text{-CH} \\ | \\ \text{CH}_3 \end{array}$  2,4-dimethyl pentane
- (5)  $\text{CH}_3\text{-CH}_2\text{-CH}_2\text{-CH}_2\text{-CH}\begin{array}{c} \text{CH}_3 \\ | \\ \text{CH}_3 \end{array}\text{-CH-CH}_3$  2,3-dimethyl heptane
- (6)  $\text{CH}_3\text{-C}\begin{array}{c} \text{CH}_3 \\ | \\ \text{CH}_3 \end{array}\text{-CH}_2\text{-CH}\begin{array}{c} \text{C}_2\text{H}_5 \\ | \\ \text{C}_2\text{H}_5 \end{array}\text{-CH-CH}_2\text{-CH}_3$  4,5-diethyl-2,2-dimethyl heptane
- (7)  $\text{CH}_3\text{-CH}\begin{array}{c} \text{CH}_3 \\ | \\ \text{CH}_2 \\ | \\ \text{CH}_3 \end{array}\text{-CH}_2\text{-CH}_2\text{-CH}_2$  2-methyl heptane
- (8)  $\text{CH}_3\text{-(CH}_2\text{)}_5\text{-CH}\begin{array}{c} \text{CH}_3 \\ | \end{array}\text{-CH}_3$  2-methyl octane
- (9)  $\text{CH}_2\begin{array}{c} \text{CH}_3 \\ | \\ \text{CH}_2 \\ | \\ \text{CH}_3 \end{array}\text{-CH}_2\text{-CH}_2\text{-CH}_2$  hexane
- (10)  $\text{CH}_3\text{CH}_2\text{CH}_2\text{CH}_2\text{CH}_3$  pentane
- (11)  $\text{CH}_3\text{-CH}\begin{array}{c} \text{C}_2\text{H}_5 \\ | \\ \text{C}_2\text{H}_5 \end{array}\text{-CH-CH}_2\text{-CH}\begin{array}{c} \text{C}_2\text{H}_5 \\ | \\ \text{C}_2\text{H}_5 \end{array}\text{-CH}_3$  4-ethyl-3,6-dimethyl octane
- (12)  $\text{CH}_3\text{-CH}\begin{array}{c} \text{CH}_3 \\ | \\ \text{CH}_3 \end{array}\text{-CH}\begin{array}{c} \text{CH}_3 \\ | \\ \text{CH}_3 \end{array}\text{-CH}\begin{array}{c} \text{CH}_3 \\ | \\ \text{CH}_3 \end{array}\text{-CH}\begin{array}{c} \text{CH}_3 \\ | \\ \text{CH}_3 \end{array}\text{-CH}_3$  2,3,4,5-tetramethyl heptane



ALKENES I



ALKYNES

(1)  $\text{CH}\equiv\text{C}-\text{CH}_3$  propyne (don't need a # b/c there is nowhere else it could be)

(2)  $\text{CH}_3\text{C}\equiv\text{C}-\underset{\text{CH}_3}{\text{CH}}-\text{CH}_3$  4-methyl-2-pentyne

(3)  $\text{CH}_3-\overset{\text{CH}_3}{\underset{\text{CH}_3}{\text{CH}}}-\text{CH}-\text{C}\equiv\text{CH}$  3,4-dimethyl-1-pentyne

(4)  $\text{CH}\equiv\text{C}-\overset{\text{CH}_3}{\text{CH}}-\text{C}\equiv\text{C}-\text{CH}_3$  3-methyl-1,4-hexadiyne

(5)  $\text{CH}_3-\underset{\text{CH}_2\text{CH}_3}{\text{CH}}-\text{CH}_2-\text{C}\equiv\text{C}-\text{CH}_3$  5-methyl-2-heptyne

(6) 2-butyne  $\begin{array}{c} | & & | \\ -\text{C} & -\text{C}\equiv\text{C}- & \text{C}- \\ | & & | \end{array}$

(7) 4-methyl-2-pentyne  $\begin{array}{c} & \text{CH}_3 & & & \\ & | & & & \\ -\text{C} & -\text{C} & -\text{C}\equiv\text{C}- & \text{C}- & \\ | & | & & | & \end{array}$

(8) 4-ethyl-2,5-heptadiyne  $\begin{array}{c} & & & & & & \\ & & & & & & \\ -\text{C} & -\text{C}\equiv\text{C}- & \text{C} & -\text{C}\equiv\text{C}- & \text{C}- & \\ & & \text{C}_2\text{H}_5 & & & & \end{array}$

(9) 3-methyl-1-butyne  $\begin{array}{c} & & & & \\ & & & & \\ -\text{C}\equiv\text{C}- & \text{C} & -\text{C}- & \\ & \text{CH}_3 & & \end{array}$

(10) 3,4-dimethyl-1-pentyne  $\begin{array}{c} & & & \text{CH}_3 & & \\ & & & | & & \\ -\text{C}\equiv\text{C}- & \text{C} & -\text{C} & -\text{C}- & \\ & \text{CH}_3 & & | & \end{array}$



Name: \_\_\_\_\_

Block: \_\_\_\_\_

Date: \_\_\_\_\_

Chemistry 11

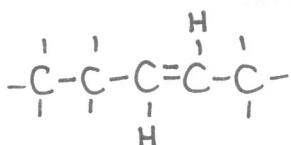
Cis-Trans Isomerization Worksheet

Assignment

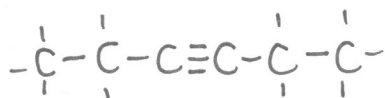
Complete the following questions on a separate piece of paper.

1) Draw the actual shape of the following molecules using condensed structures:

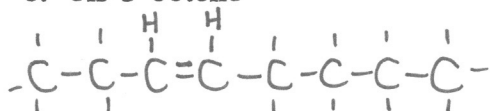
a. trans-2-hexene



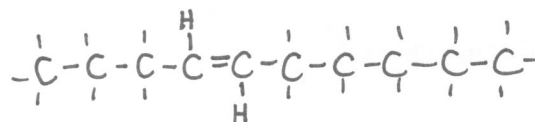
b. 3-hexyne



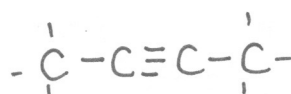
c. cis-3-octene



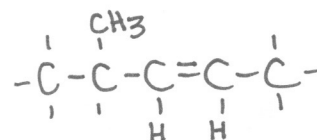
d. trans-4-decene



e. 2-butyne

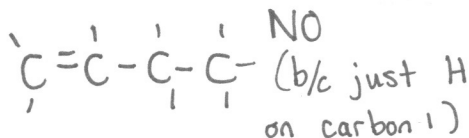


f. 4-methyl-cis-2-pentene

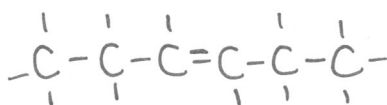


2) Which of the following molecules can exhibit cis-trans isomerism?

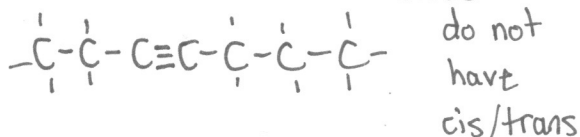
a. 1-butene



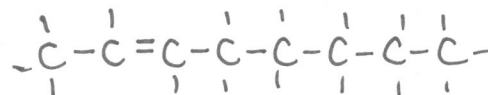
b. 3-hexene YES



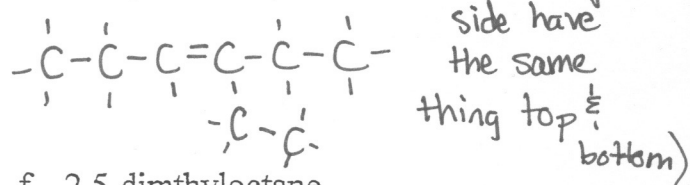
c. 4-heptyne NO (b/c triple bonds



d. 2-octene YES



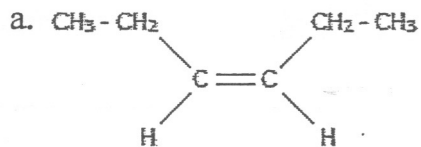
e. 3-ethyl-3-hexene NO (b/c the right



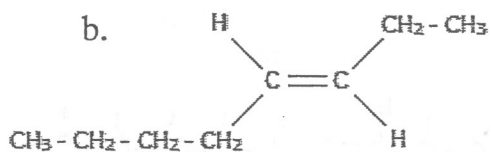
f. 2,5-dimethyloctane NO

no double bond.

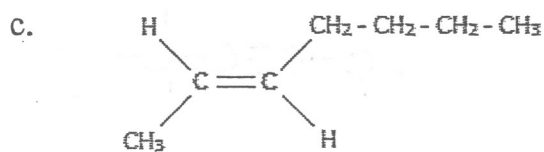
3) Name the following as "cis" or "trans" isomers.



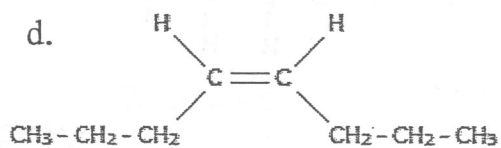
cis-3-hexene



trans-3-octene



trans-2-heptene



cis-4-octene

# FUNCTIONAL GROUPS

Name \_\_\_\_\_

Classify each of the organic compounds below as an alcohol, carboxylic acid, aldehyde, ketone, ether or ester, and draw its structural formula.

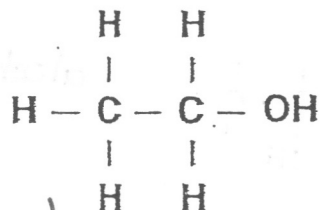
<p>1. <math>\text{CH}_3\text{COOH}</math></p> $\begin{array}{c} \text{O} \\ \parallel \\ -\text{C}-\text{C}-\text{OH} \\   \quad   \end{array}$ <p>carboxylic acid</p>	<p>6. <math>\text{CH}_3\text{CH}(\text{OH})\text{CH}_3</math></p> $\begin{array}{c}   \quad   \quad   \\ -\text{C}-\text{C}-\text{C}- \\   \quad   \quad   \\ \quad \quad \text{OH} \end{array}$ <p>alcohol</p>
<p>2. <math>\text{CH}_3\text{COCH}_3</math></p> $\begin{array}{c} \text{O} \\ \parallel \\ -\text{C}-\text{C}-\text{C}- \\   \quad   \quad   \end{array}$ <p>Ketone</p>	<p>7. <math>\text{CH}_3\text{CH}_2\text{COOH}</math></p> $\begin{array}{c} \text{O} \\ \parallel \\ -\text{C}-\text{C}-\text{C}-\text{OH} \\   \quad   \quad   \end{array}$ <p>carboxylic acid</p>
<p>3. <math>\text{CH}_3\text{CH}_2\text{OH}</math></p> $\begin{array}{c}   \quad   \\ -\text{C}-\text{C}-\text{OH} \\   \quad   \end{array}$ <p>alcohol</p>	<p>8. <math>\text{CH}_3\text{CH}_2\text{COOCH}_3</math></p> $\begin{array}{c} \text{O} \\ \parallel \\ -\text{C}-\text{C}-\text{C}-\text{O}-\text{C}- \\   \quad   \quad   \quad   \end{array}$ <p>Ester</p>
<p>4. <math>\text{CH}_3\text{CH}_2\text{OCH}_3</math></p> $\begin{array}{c}   \quad   \quad   \\ -\text{C}-\text{C}-\text{O}-\text{C}- \\   \quad   \quad   \end{array}$ <p>Ether</p>	<p>9. <math>\text{CH}_3\text{CH}_2\text{COCH}_3</math></p> $\begin{array}{c} \text{O} \\ \parallel \\ -\text{C}-\text{C}-\text{C}-\text{C}- \\   \quad   \quad   \quad   \end{array}$ <p>Ketone</p>
<p>5. <math>\text{CH}_3\text{CH}_2\text{CHO}</math></p> $\begin{array}{c} \text{O} \\ \parallel \\ -\text{C}-\text{C}-\text{C}-\text{H} \\   \quad   \quad   \end{array}$ <p>Aldehyde</p>	<p>10. <math>\text{CH}_3\text{OCH}_3</math></p> $\begin{array}{c}   \quad   \\ -\text{C}-\text{O}-\text{C}- \\   \quad   \end{array}$ <p>Ether</p>

# NAMING OTHER ORGANIC COMPOUNDS

Name \_\_\_\_\_

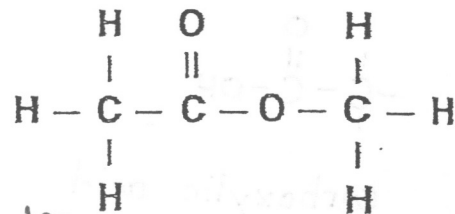
Name the compounds below.

1.



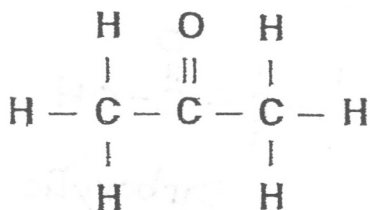
ethanol

6.



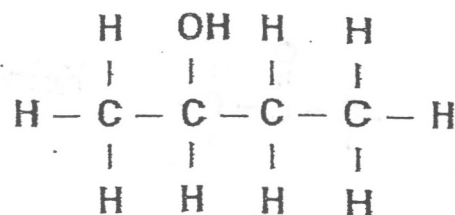
An Ester

2.



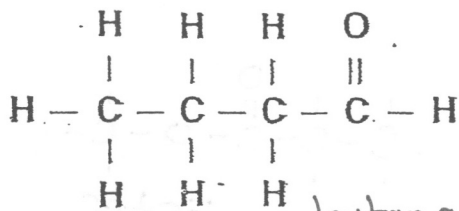
propanone

7.



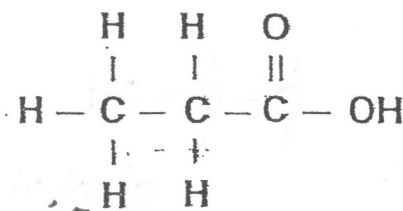
2-butanol

3.



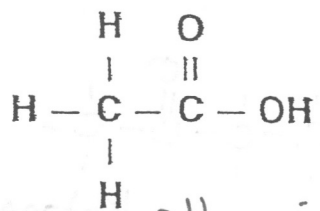
butanal

8.



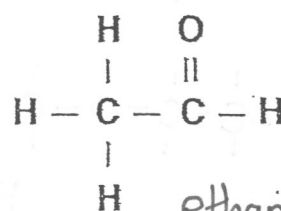
propanoic acid

4.



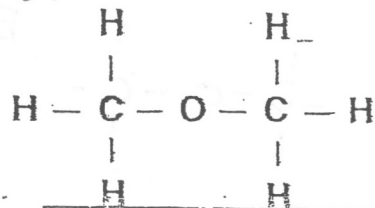
ethanoic acid

9.

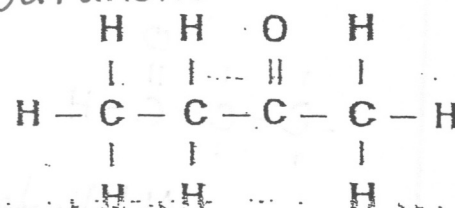


ethanal

5. An Ether



10. butanone



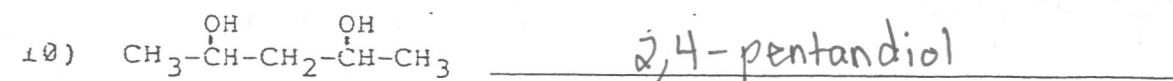
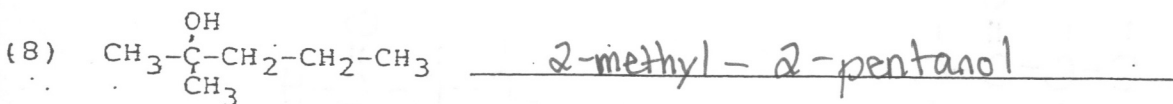
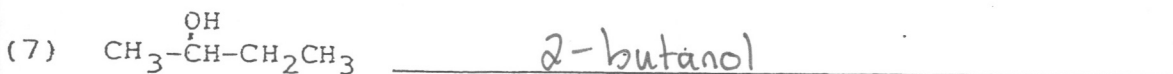
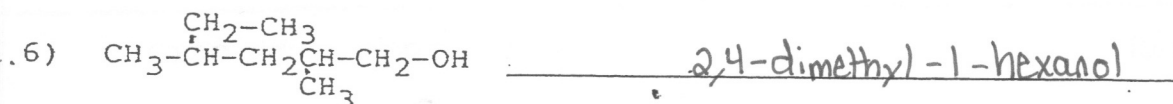
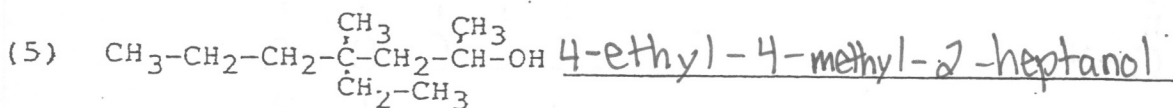
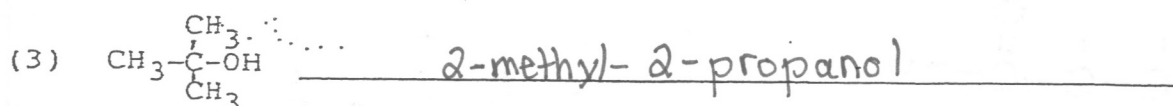
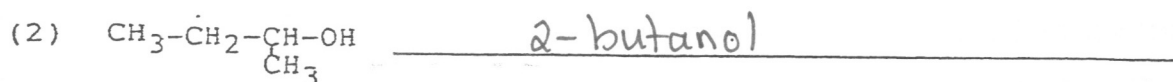
# STRUCTURES OF OTHER ORGANIC COMPOUNDS

Name \_\_\_\_\_

Draw the structures of the compounds below.

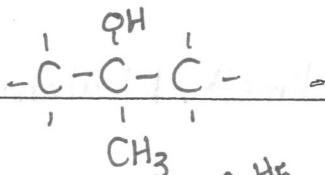
<p>1. butanoic acid</p> $\begin{array}{cccc}   &   &   & O \\ -C & -C & -C & -C-OH \\   &   &   & \\ & & & \end{array}$	<p><del>6.</del> methylmethanoate (methyl formate)</p> $\begin{array}{ccc} & O & \\ &    & \\ -C & -C & -O-C- \\   & &   \end{array}$
<p>2. methanal</p> $\begin{array}{c} O \\    \\ H-C-H \end{array}$	<p>7. 3-pentanol</p> $\begin{array}{ccccc} & & OH & & \\ & &   & & \\ -C & -C & -C & -C & -C- \\   &   &   &   &   \end{array}$
<p>3. methanol</p> $\begin{array}{c}   \\ -C-OH \\   \end{array}$	<p>8. methanoic acid (formic acid)</p> $\begin{array}{c} O \\    \\ H-C-OH \end{array}$
<p>4. butanone</p> $\begin{array}{cccc} & & O & \\ & &    & \\ -C & -C & -C & -C- \\   &   &   &   \end{array}$	<p>9. propanal</p> $\begin{array}{ccc} & & O \\ & &    \\ -C & -C & -C-H \\   &   & \end{array}$
<p><del>5.</del> diethyl ether</p> $\begin{array}{ccccc}   &   & &   &   \\ -C & -C & -O & -C & -C- \\   &   & &   &   \end{array}$	<p>10. 2-pentanone</p> $\begin{array}{ccccc} & & O & & \\ & &    & & \\ -C & -C & -C & -C & -C- \\   &   &   &   &   \end{array}$

## ALCOHOL I



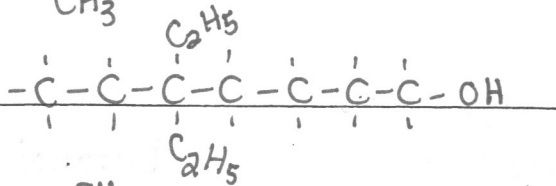
ALCOHOL II :

1) 2-methylpropanol

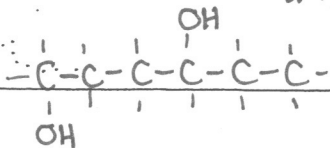


(2) 3,4-diethylheptanol

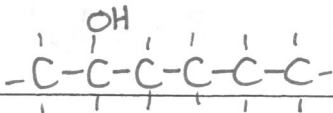
? not sure where OH would be?



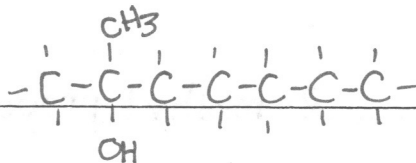
(3) 1,4-hexanediol



(4) 2-hexanol

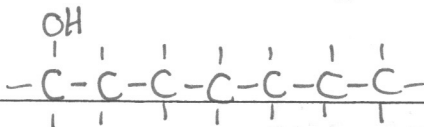


(5) 2-methyl-2-heptanol

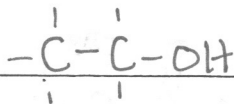


6) heptanol

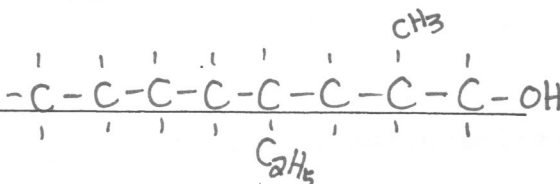
? missing the #?



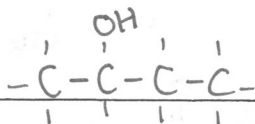
(7) ethanol



(8) 2-methyl-4-ethyl-1-octanol

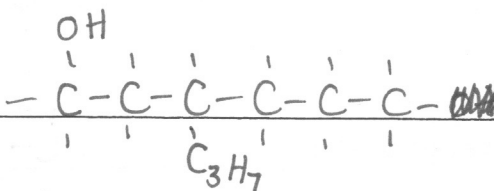


(9) 2-butanol

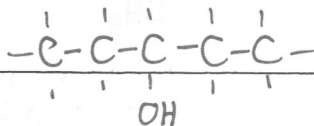


(10) 3-propylhexanol

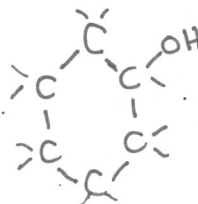
? # missing



(11) 3-pentanol



(12) cyclohexanol



ACIDS

