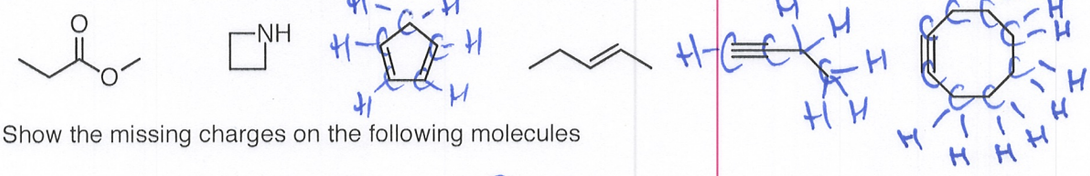
Partial Key

Worksheet 1: Line-Angle Notation

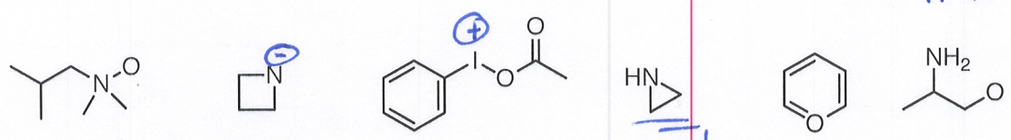
Skill-Building Goals: To become comfortable drawing and interpreting line-angle notation drawings.

1. Draw a few Lewis structures based on the following molecular formula and convert them into line-angle notation
1a. C_5H_6, 1b. CH_2O, 1c. C_2H_4, 1d. CH_2N_2, 1e. C_3H_5N, $C_5H_6N^+$, $C_2H_3O_2^-$

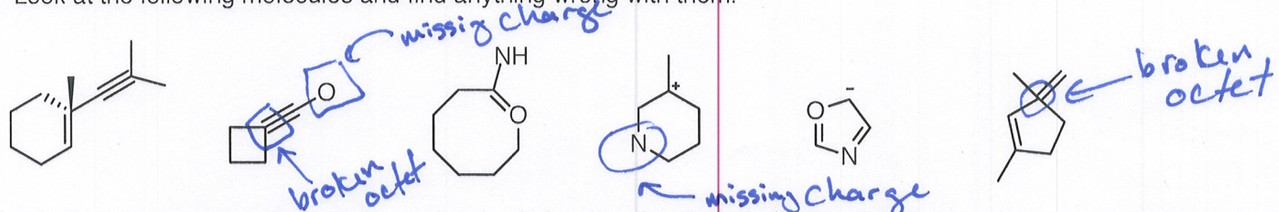
2. Draw in all of the carbon, hydrogen, and lone pairs of the following molecules.



3. Show the missing charges on the following molecules

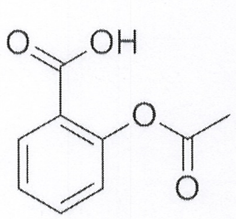


4. Look at the following molecules and find anything wrong with them.

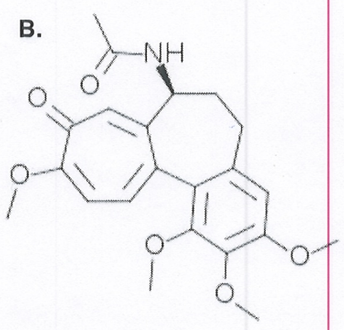


5. (1) Re-draw the following complex molecules in Lewis pair structure. (2) Appreciate why we have line-angle notation. (3) Try to re-draw them in line-angle notation. (4) Try to find mistakes. (5) Correct the mistakes.

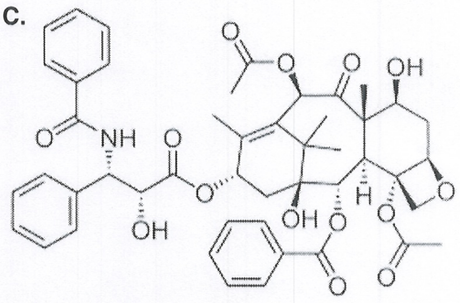
A.



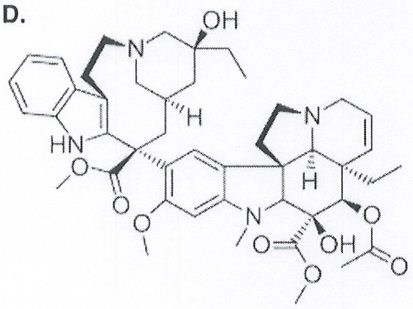
B.



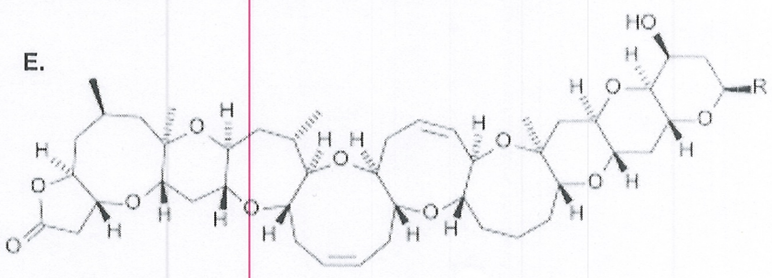
C.



D.



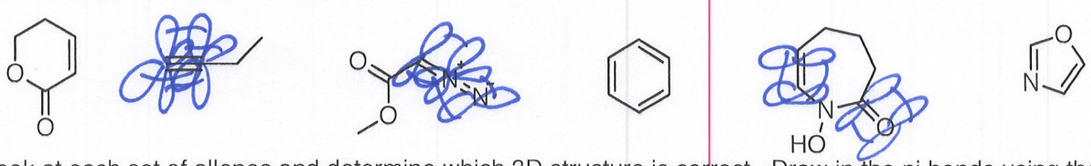
E.



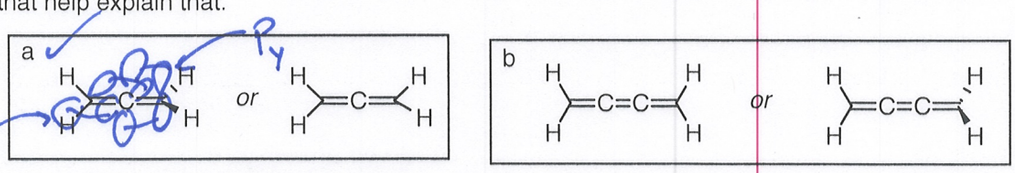
Worksheet 2: Hybridization and Stereochemistry

Skill-Building Goals: Become comfortable drawing molecules in 3D and recognizing similarities and differences between stereoisomers

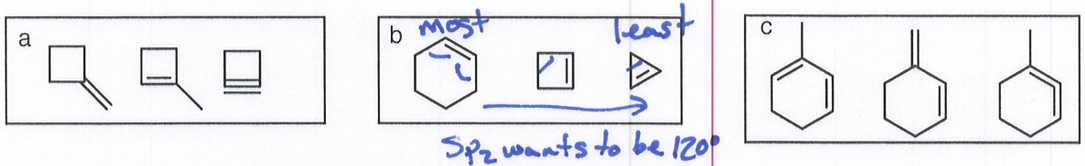
1. Refer to the following molecules. Show all of the pi bonds using the p orbitals. How many atoms for each one are sp3 hybridized? sp2? sp? Identify them.



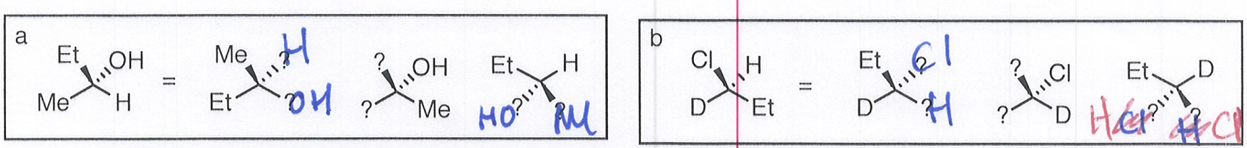
2. Look at each set of allenes and determine which 3D structure is correct. Draw in the pi bonds using the p orbitals that help explain that.



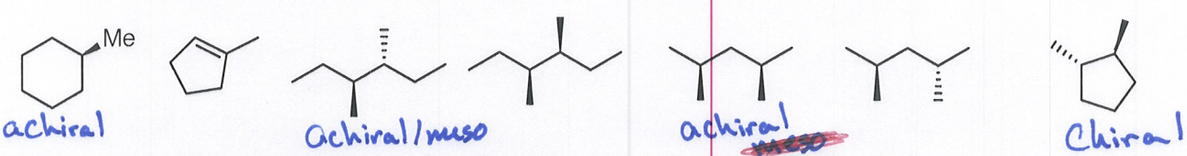
3. Rank the following in order of stability. Explain your reasoning.



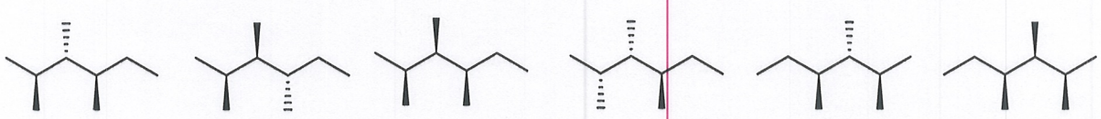
4. Is the stereochemistry of the molecule shown (R) or (S)? Fill in the blanks to help redraw the molecule. Then check the (R) and/or (S) designation to make sure it is correct.



5. Are the following molecules chiral or achiral? If achiral, are they meso?



6. What are the relationships between each of the following molecules? Options are constitutional isomer, diastereomer, enantiomer, or identical

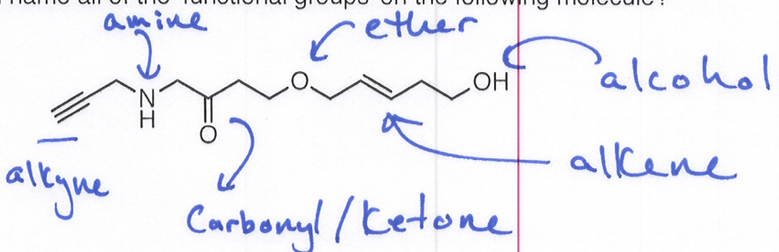


	A	B	C	D	E	F
A	—	E	D	I	E	D
B	E	—	D	E	I	D
C	D	D	—	D	D	E
D	I	E	D	—	D	D
E	E	I	D	D	—	D
F	D	D	E	D	D	—

Worksheet 3: IUPAC and Naming

Skill-Building Goals: Get comfortable knowing what to call different functional groups, have a baseline understanding of alkyl groups. Complex IUPAC will not be necessary for this class.

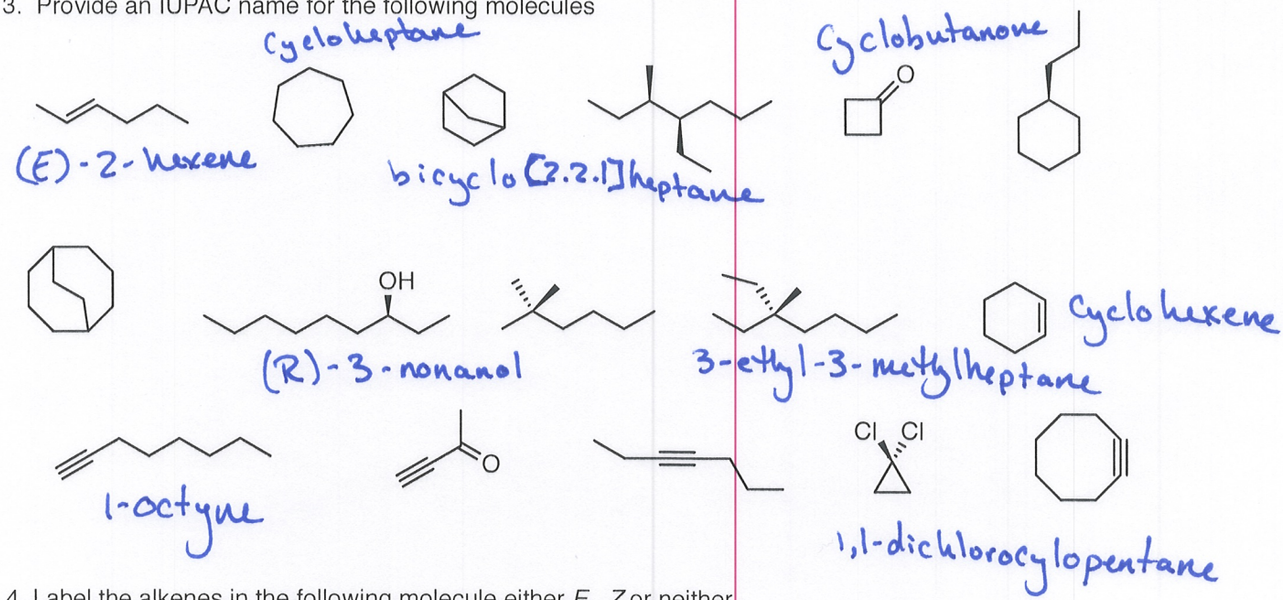
1. Can you circle and name all of the 'functional groups' on the following molecule?



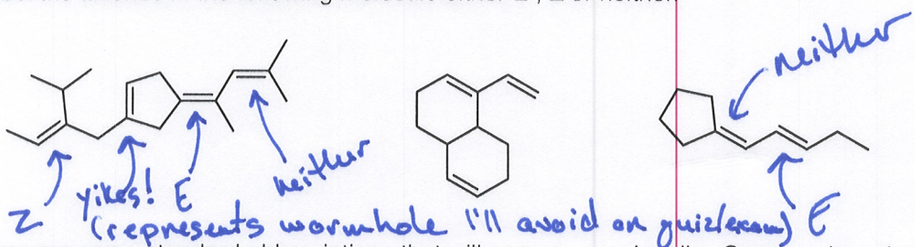
2. Provide a name and abbreviation for the following linear alkyl chains.

$R-CH_3$	$R-CH_2CH_2CH_3$	$R-CH_2CH_2CH_2CH_2CH_3$	$R-CH_2CH_2CH_2CH_2CH_2CH_3$
$R-CH_2CH_3$	$R-CH_2CH_2CH_2CH_3$	$R-CH_2CH_2CH_2CH_2CH_2CH_3$	$R-CH_2CH_2CH_2CH_2CH_2CH_2CH_3$

3. Provide an IUPAC name for the following molecules



4. Label the alkenes in the following molecule either *E* , *Z* or neither.



5. Here are some standard abbreviations that will pop up occasinoally. Can you draw them?

t-Bu, *i*-Pr, Ac, Ph, Me, Et