
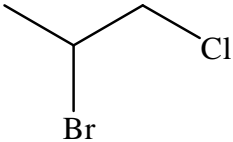
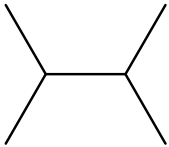
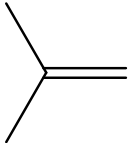
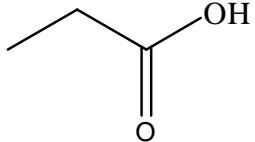
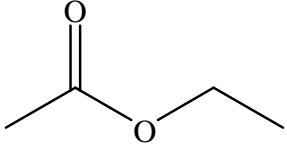
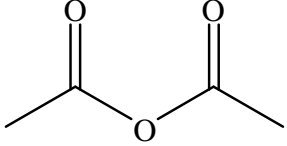
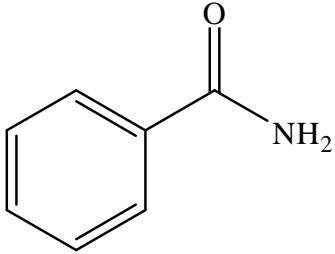
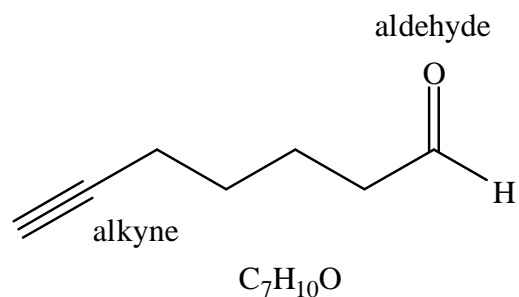
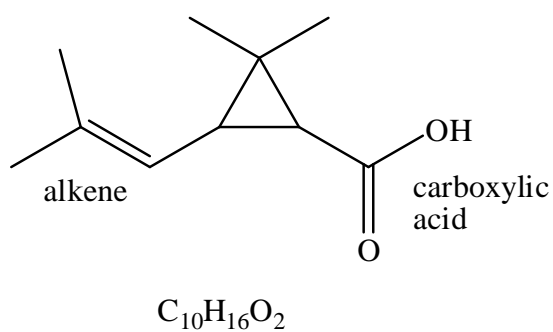
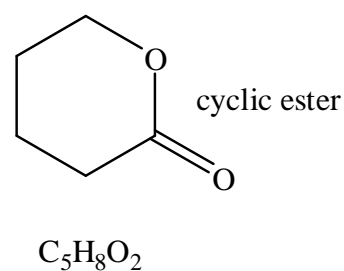
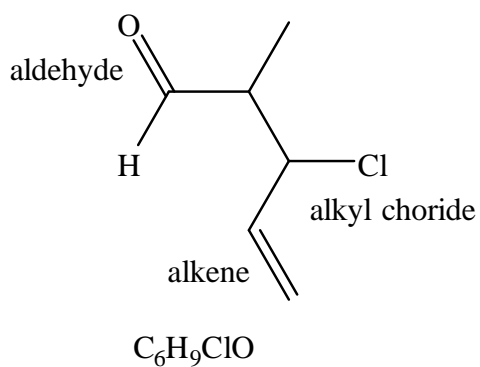
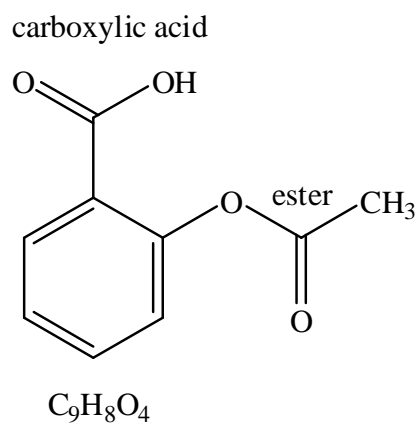
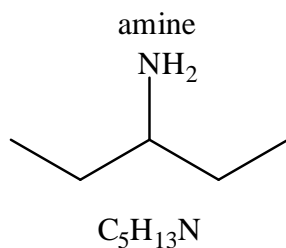
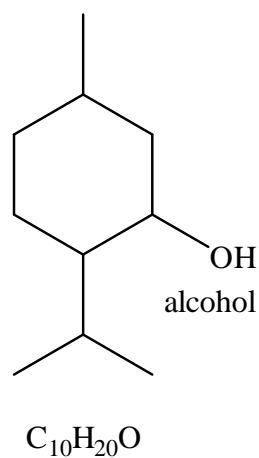
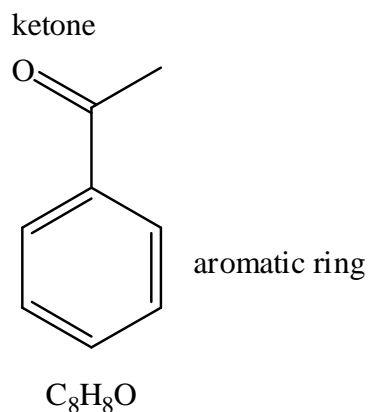


## CHEM1002 Answers to Problem Sheet 2

1.

Compound	Condensed structural formula	Stick representation
$\text{CH}_3\text{COCH}_3$	$\begin{array}{c} \text{O} \\ \parallel \\ \text{CH}_3-\text{C}-\text{CH}_3 \end{array}$	
$\text{CH}_3\text{CHBrCH}_2\text{Cl}$	$\begin{array}{c} \text{CH}_3-\text{CH}-\text{CH}_2-\text{Cl} \\   \\ \text{Br} \end{array}$	
$(\text{CH}_3)_2\text{CHCH}(\text{CH}_3)_2$	$\begin{array}{c} \text{CH}_3 \\   \\ \text{CH}_3-\text{CH}-\text{CH}-\text{CH}_3 \\   \\ \text{CH}_3 \end{array}$	
$(\text{CH}_3)_2\text{CCH}_2$	$\begin{array}{c} \text{H}_3\text{C} \\ \diagdown \\ \text{C}=\text{CH}_2 \\ \diagup \\ \text{H}_3\text{C} \end{array}$	
$\text{CH}_3\text{CH}_2\text{COOH}$	$\begin{array}{c} \text{O} \\ \parallel \\ \text{CH}_3-\text{CH}_2-\text{C}-\text{OH} \end{array}$	
$\text{CH}_3\text{COOCH}_2\text{CH}_3$	$\begin{array}{c} \text{O} \\ \parallel \\ \text{CH}_3-\text{C}-\text{O}-\text{CH}_2-\text{CH}_3 \end{array}$	
$\text{CH}_3\text{COOCOCH}_3$	$\begin{array}{c} \text{O} \quad \quad \text{O} \\ \parallel \quad \quad \parallel \\ \text{CH}_3-\text{C}-\text{O}-\text{C}-\text{CH}_3 \end{array}$	
benzamide ( $\text{C}_6\text{H}_5\text{CONH}_2$ )	$\begin{array}{c} \text{O} \\ \parallel \\ \text{H} \\ \diagdown \\ \text{HC}=\text{C} \\ \diagup \\ \text{HC} \\ \parallel \\ \text{HC} \\ \parallel \\ \text{H} \end{array} \quad \begin{array}{c} \text{O} \\ \parallel \\ \text{C}-\text{NH}_2 \end{array}$	

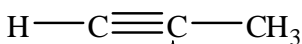
2. Remember to count hydrogen atoms – draw them in if necessary. C makes 4 bonds and has no lone pairs, N makes 3 bonds and has 1 lone pair, O normally makes 2 bonds and has 2 lone pairs and Cl makes 1 bond and has 3 lone pairs.



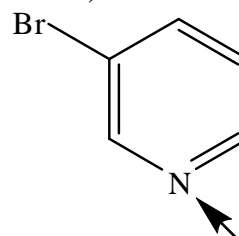
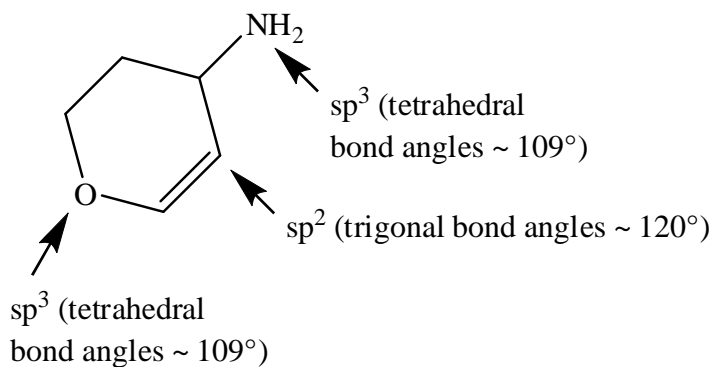
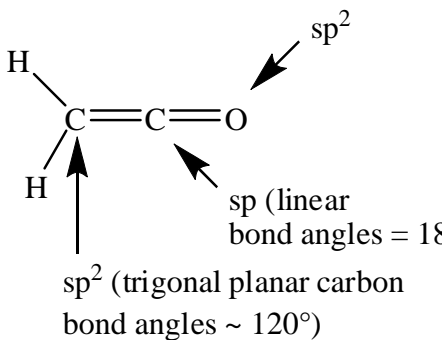
3.



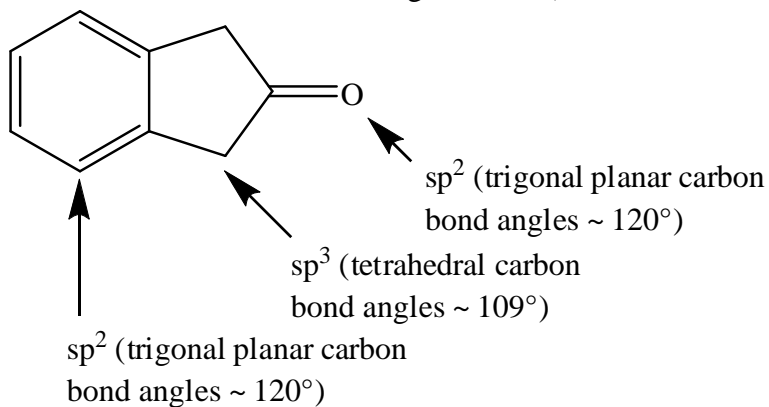
$sp^2$  (trigonal planar carbon  
bond angles  $\sim 120^\circ$ )



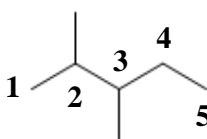
$sp$  (linear  
bond angles =  $180^\circ$ )



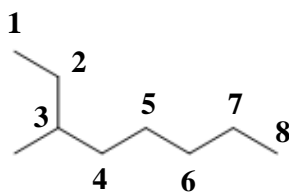
$sp^2$  (trigonal planar  
bond angles  $\sim 120^\circ$ )



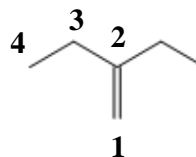
4.



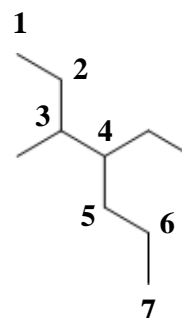
2,3-dimethylpentane



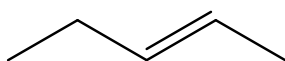
3-methyloctane



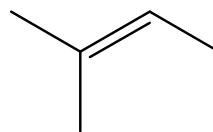
2-ethylbut-1-ene



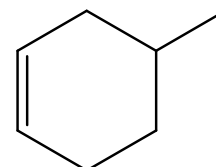
4-ethyl-3-methylheptane



(*E*)-pent-2-ene



2-methyl-2-butene



(*Z*)-4-methylcyclohex-1-ene

5.

**stereoisomers**

**constitutional isomers**

