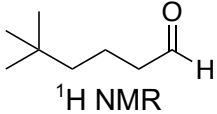
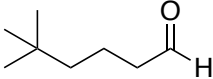


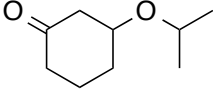
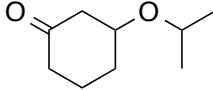
### CHEM 110L NMR Problem Set #1

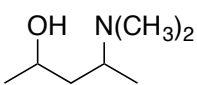
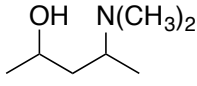
These problems will be incorporated into an auto-graded Canvas quiz...

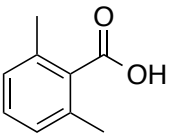
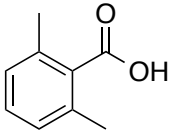
**1. Predict the detailed  $^1\text{H}$  NMR spectrum** for each compound below using the NMR reference tables online and the table format below. Approximate chemical shifts within provided ranges and relative to other signals in the molecule (no ranges). The correlation tables in the Mohrig textbook can be used as a training tool to calculate more exact values and/or check your work. Work independently on each molecule to the best of your ability before discussing with others!

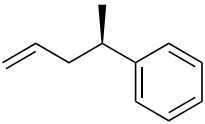
**2. Sketch the  $^{13}\text{C}$  NMR spectrum** for each compound, including approximate chemical shifts (no ranges) and peak heights relative to other signals within the molecule. Use NMR tables.

Structure (add letters for labels)	Assignment (corresponds to label on structure)	Chemical Shift (ppm)	Integration (# H's per signal)	Splitting
 $^1\text{H}$ NMR				
<b>Sketch of <math>^1\text{H}</math> NMR spectrum:</b>				
<b>12</b>		<b>Chemical Shift (ppm)</b>	<b>0</b>	
 $^{13}\text{C}$ NMR sketch				
<b>220</b>		<b>Chemical Shift (ppm)</b>	<b>0</b>	

Structure	Assignment	Chemical Shift (ppm)	Integration	Splitting
 <p><sup>1</sup>H NMR</p>				
<p>Sketch of <sup>1</sup>H NMR spectrum:</p>				
<p>12 <span style="margin-left: 200px;">Chemical Shift (ppm)</span> <span style="float: right;">0</span></p>				
 <p><sup>13</sup>C NMR sketch</p>				
<p>220 <span style="margin-left: 200px;">Chemical Shift (ppm)</span> <span style="float: right;">0</span></p>				

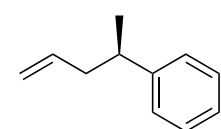
Structure	Assignment	Chemical Shift (ppm)	Integration	Splitting
 <p><sup>1</sup>H NMR</p>				
<p><b>Sketch of <sup>1</sup>H NMR spectrum:</b></p>				
<p><b>12</b> <span style="margin-left: 150px;"><b>Chemical Shift (ppm)</b></span> <span style="float: right;"><b>0</b></span></p>				
 <p><sup>13</sup>C NMR sketch</p>				
<p><b>220</b> <span style="margin-left: 150px;"><b>Chemical Shift (ppm)</b></span> <span style="float: right;"><b>0</b></span></p>				

Structure	Assignment	Chemical Shift (ppm)	Integration	Splitting
 <p><sup>1</sup>H NMR</p>				
<p><b>Sketch of <sup>1</sup>H NMR spectrum:</b></p>				
<hr/> <p>12 <span style="margin-left: 200px;">Chemical Shift (ppm)</span> <span style="float: right;">0</span></p>				
 <p><sup>13</sup>C NMR sketch</p>				
<hr/> <p>220 <span style="margin-left: 200px;">Chemical Shift (ppm)</span> <span style="float: right;">0</span></p>				

Structure	Assignment	Chemical Shift (ppm)	Integration	Splitting
 <sup>1</sup> H NMR				

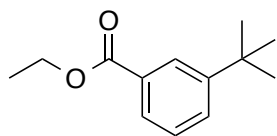
Sketch of <sup>1</sup>H NMR spectrum:

12 Chemical Shift (ppm) 0



<sup>13</sup>C NMR sketch

220 Chemical Shift (ppm) 0



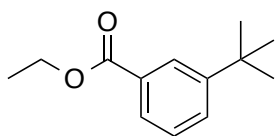
$^1\text{H}$  NMR

Sketch of  $^1\text{H}$  NMR spectrum:

12

Chemical Shift (ppm)

0



$^{13}\text{C}$  NMR sketch

220

Chemical Shift (ppm)

0