1. Which conformer is higher in energy for each pair? Explain.

A. 

B. 

2. Consider the structure below and draw its most and least stable conformations in Newman projections while looking down the bond indicated. Put your final answers in the box.

CH₃CH₂CHCH₂CH₃

CH₃

MOST STABLE

LEAST STABLE

3. Draw line drawings for the following Newman projections.

4. Regarding the conformations below for 1-bromopropane, provide the order of stability from least to most stable and lowest to highest energy?

A

B

C

D

LEAST STABLE

LOWEST ENERGY

MOST STABLE

HIGHEST ENERGY
5. For the compound below, label each substituent as axial or equatorial. Draw a flat structure with wedges and dashes. Draw the second possible chair structure for the compound. Circle the more stable conformer.

6. Circle the most stable conformation for each pair of chair configurations. If the configurations are equal, then state this. Consult a table ΔG values to answer these questions. Calculate the energy that is released or absorbed as the following rings flip from right to left.

<table>
<thead>
<tr>
<th>Group</th>
<th>ΔG(^0) kJ/mol</th>
<th>ΔG(^0) kcal/mol</th>
<th>Group</th>
<th>ΔG(^0) kJ/mol</th>
<th>ΔG(^0) kcal/mol</th>
</tr>
</thead>
<tbody>
<tr>
<td>C≡C≡N</td>
<td>0.8</td>
<td>0.19</td>
<td>NH(_2)</td>
<td>5.9</td>
<td>1.41</td>
</tr>
<tr>
<td>F</td>
<td>1.0</td>
<td>0.24</td>
<td>COOH</td>
<td>5.9</td>
<td>1.41</td>
</tr>
<tr>
<td>C≡C≡CH</td>
<td>1.7</td>
<td>0.41</td>
<td>CH≡CH(_2)</td>
<td>7.1</td>
<td>1.70</td>
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<tr>
<td>I</td>
<td>1.9</td>
<td>0.45</td>
<td>CH(_3)</td>
<td>7.28</td>
<td>1.74</td>
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<tr>
<td>Cl</td>
<td>2.2</td>
<td>0.53</td>
<td>CH(_3)(_3)</td>
<td>7.3</td>
<td>1.75</td>
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<tr>
<td>Br</td>
<td>2.4</td>
<td>0.57</td>
<td>CH(CH(_3))(_2)</td>
<td>9.0</td>
<td>2.15</td>
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<tr>
<td>OH</td>
<td>3.9</td>
<td>0.93</td>
<td>C(CH(_3))(_3)</td>
<td>21.0</td>
<td>5.00</td>
</tr>
</tbody>
</table>
7. Label each pair of compounds as isomers (I), constitutional isomers (CI), identical molecules (ID), or no relationship (NR) of each other.

8. Draw both chair conformations for each substituted cyclohexane below, and determine which conformation is more stable. If necessary, use the G table (below) to help you arrive at an answer. (Yes, you will have to do this on a separate piece of paper.)