Problem set from Chapter 4

1.(14) Consider the molecule **1,1-dibromopropane**. In the space below (a-d), sighting along C_1 - C_2 , **construct Newman projections** of the four unique conformations: two *different* staggered and two *different* eclipsed conformations. Using the information below, give the relative energies of the four conformations. What is the barrier to rotation in KJ/mol?_____

Interaction	Energy (KJ/mol)		
H-H eclipse	4.0		
CH ₃ -H <i>eclipse</i>	6.0		
Br-H <i>eclipse</i>	5.0		
Br-CH₃ gauche	3.0		
CH ₃ -Br <i>eclipse</i>	13.0		
a)	b)	c)	d)

2.(14) Consider the molecule *trans* 1-bromo-4-ethylcyclohexane. The energy **barrier to flipping is 10.0 KJ/mole.**

a) Draw the two flip chair conformations of this molecule.

- b) Circle the more stable conformation.
- c) If the energy of one ethyl-H 1,3-diaxial interaction is 4.0 KJ/mol, what is the value of one bromine-H 1,3-diaxial interaction?
- d) What is more spacially (sterically) demanding, a Br atom or a CH₃ group? _____

3.(12) Draw the two flip *chair conformations* of *trans* 1-ethyl-4-methylcyclohexane. Also, draw a *Newman projection* of the less stable conformation (cite along C_1 - C_2 and C_5 - C_4).