1. (3 points) Next to the structure, write the name of the following:



Name\_3,3-dimethyl-5-propylnonane\_\_\_\_\_\_

1. (3 points) Write line-angle formulas for the following alkanes or cycloalkanes. You may need to add wedges and/or dashes to the structures. *Your answer must be a line angle formula to receive credit!*

3-t-Butyl-6,6-diethylnonane



1. (3 points) Describe the relationship between each of the following pairs of structures as one of the following: identical, cis-trans isomers, constitutional isomers, or different compounds.



\_\_\_\_\_identical\_\_\_\_\_

1. (4 points) Complete the following reaction and balance the equation



1. ( 6 points) Name the ring structure with geometry and draw the most stable chair forms of the following compound. Clearly indicate if a group is in an equatorial or axial position. (Chair form provided))





Name\_\_\_cis-1-isobutyl-4-methylcyclohexane\_\_\_\_\_

1. (4 points) Draw all products of the following reactions:



1. (4 points) Identify all the circled functional groups

