1) Predict the major product(s) of the following reactions. If no reaction will occur, write "no reaction". Δ = heat

a)

b)

c)

d)

No Rxn

e)

f)

g)
2) Name the compounds below using the IUPAC system making sure to account for all stereochemistry.

a)

\[
\text{4-methylhex-2-ene}
\]

b)

\[
\text{1,2,4-trichloro-2,4-pentadiene}
\]

c)

\[
\text{Vinylcyclohexane}
\]
3) Draw the structures that correspond to the following IUPAC names.
   a) \((3E, 5Z)\)-2-chloroheptane
   b) 2,4,7-tribromo-oct-1,3,6-triene

4) Propose syntheses to transform the given starting materials into the desired products. Be sure to include appropriate solvents where applicable.
   a) 
   b)
5) Using proper arrow notation, propose a reaction mechanism for the formation of both products a and b.