1. (Problem 11-46b) Provide the necessary reagents to convert 1-cyclohexylethanol to (1-bromoethyl)cyclohexane in good yields. (2 points).

\[
\begin{array}{c}
\text{OH} \\
\text{CH}_3
\end{array} \quad \rightarrow \quad \begin{array}{c}
\text{Br} \\
\text{CH}_3
\end{array}
\]

2. Predict any organic products resulting from methanesulfonyl chloride addition to cyclohexanol. (2 points)

\[
\begin{array}{c}
\text{OH} \\
\text{C}_6\text{H}_{11}
\end{array} \quad \xrightarrow{\text{H}_3\text{C}-\text{S}-\text{Cl}} \quad \begin{array}{c}
\text{O} \\
\text{C}_6\text{H}_{11}
\end{array}
\]

3. Predict any organic products resulting from the reaction below. (2 points)

\[
\begin{array}{c}
\text{OH} \\
\text{C}_5\text{H}_{10}
\end{array} \quad \xrightarrow{\text{HIO}_4} \quad \begin{array}{c}
\text{C}_5\text{H}_{10}
\end{array}
\]

4. (Problem 11-41c) Provide the necessary reagents for the following conversion. (Hint: more than 1 step is required. (4 points)

\[
\begin{array}{c}
\text{MgBr} \\
\text{C}_6\text{H}_5
\end{array} \quad \rightarrow \quad \begin{array}{c}
\text{CHO} \\
\text{C}_6\text{H}_5
\end{array}
\]