Exercise 3: Steric stability and stereochemistry

The mechanism of reduction 4-t-butyl-cyclohexanone (the molecule in the middle) into an alcohol is shown below.

1. Explain how this represents a reduction of the ketone.

2. The percentage of total product for each product is given. Explain why the lower pathway product is favored by a 9:1 margin over the upper pathway product.
3. Name the following compound using the E,Z system.

\[
\text{H}_3\text{C} = \begin{array}{c}
\text{Cl} \\
\text{H} \\
\text{CH}_2\text{CH}_3
\end{array}
\]

4. During an exam in my undergraduate organic chemistry class, I encountered this question: “Draw sufficient structure(s) to describe the connectivity and spatial orientation of (Z)-1-chloro-2-fluoropropene.”

So I answered by drawing:

\[
\text{H} \\
\text{ClH}_2\text{C} \\
\text{H}
\]

Which was apparently not the correct answer (I lost all points on the question).

a. What’s wrong with my structure, as drawn?

b. Answer the question correctly below.