**Ex. 1:** Predict the major product for the following reactions. Propose a mechanism for 1a.

a) Intermediate after Michael Addition, but before Aldol Condensation:

\[ \text{1. } \text{NaOCH}_3, \text{CH}_3\text{OH} \]
\[ \text{2. } \text{O} \]
\[ \text{3. } \text{H}_2\text{O}^+ \text{ (or } \text{H}_2\text{O}) \]

Partial mechanism for Ex.1a.

b) 

\[ \text{O} \]
\[ \text{CN} \]
\[ \text{NaOCH}_3, \Delta \]

1. \text{HSCH}_2\text{CH}_2\text{SH, ZnCl}_2^* 
2. nBuLi 
3. 
4. \text{H}_3\text{O}^+ 
5. \text{HgCl}_2, \text{H}_2\text{O, CaCO}_3, \text{CH}_3\text{CN}^{**} 
6. \text{KMnO}_4, \text{O}^-, \text{H}_2\text{O, } \Delta 

\text{*Nasiri includes } \text{H}^+, \Delta 
\text{**Nasiri uses } \text{HgCl}_2, \text{H}^+, \text{H}_2\text{O, } \Delta 

Ex. 2: Predict the products and propose a mechanism for the following transformation:

Ex. 3: Propose a synthesis and mechanism for the following transformation:

*Alternate route: kick e' from 'OH α to thiazolium LG, then use thiazolium ion to deprotonate the oxonium ion.