1. (10 points) Draw an arrow-pushing mechanisms for the following transformation.

2. (10 points) Draw an arrow-pushing mechanisms for the following transformation.

3. (10 points) Deduce the structure of **E**, and draw and arrow-pushing mechanism for its formation. Be careful with the IHD - we are now dealing with nitro groups - NO<sub>2</sub> counts as halogen!

Ethyl ester, aliphatic methyl both still there

note symmetry of aryl groups

The first coupling is an illustration of vicarious nucleophilic aromatic substitution