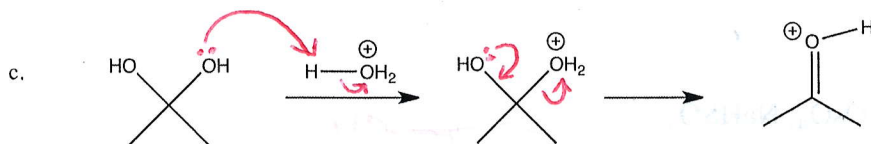
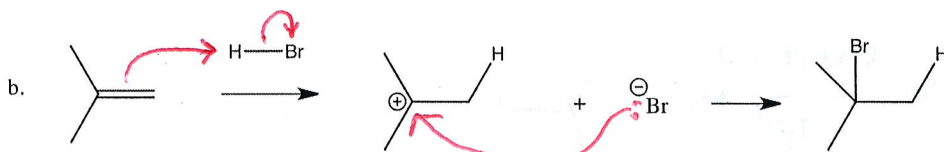
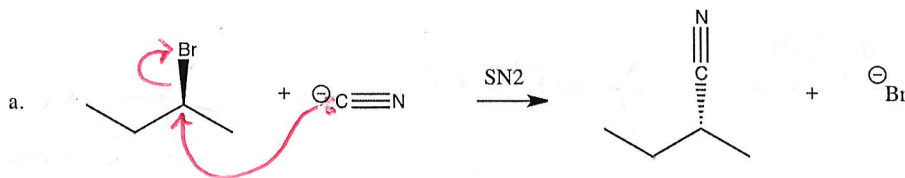


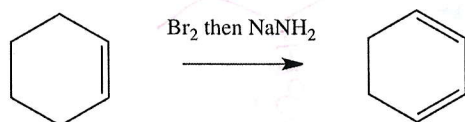
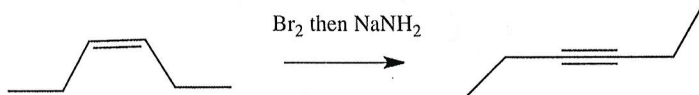
## Exam 2: What would have been...

The following is a take home practice exam. When you are ready, set a timer for 1 hour and 15 minutes. You can check your answers against the answer key. Answers will be ranked as easy (\*), medium (\*\*), and hard (\*\*\*) . Have fun!

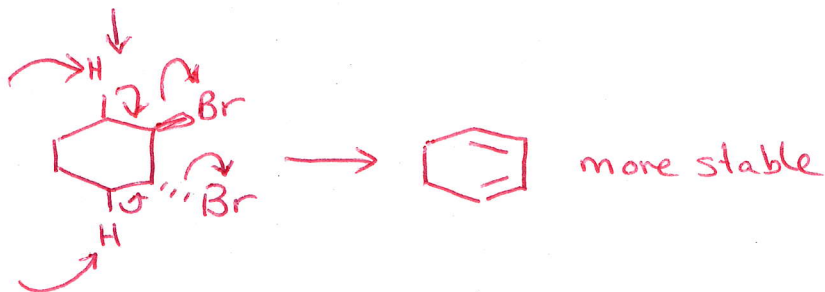
1. Show the curved arrows illustrating the following reactions. Make sure to show all bond breaking and bond forming events (10 points).\*



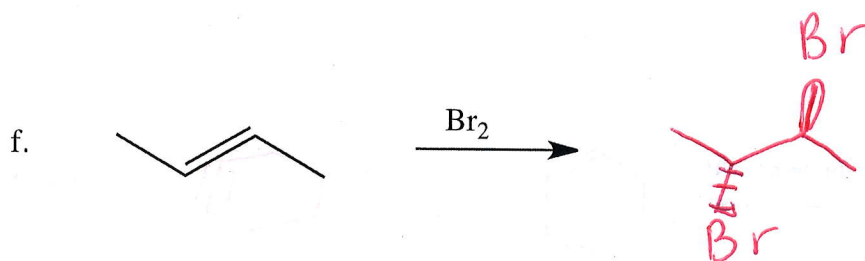
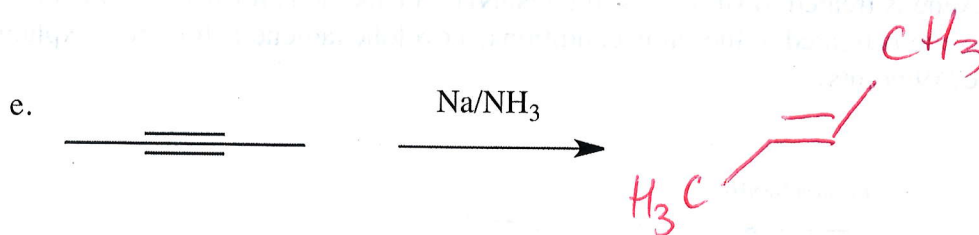
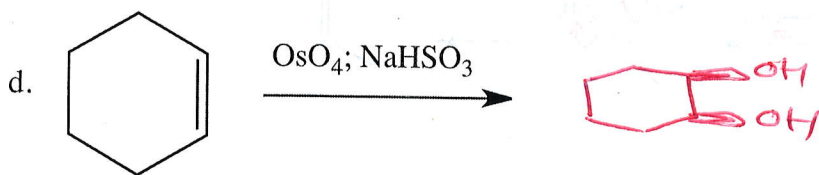
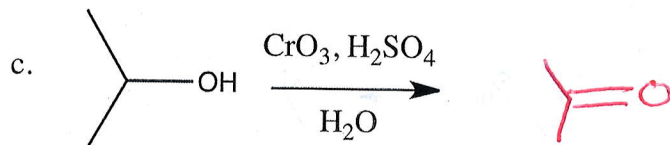
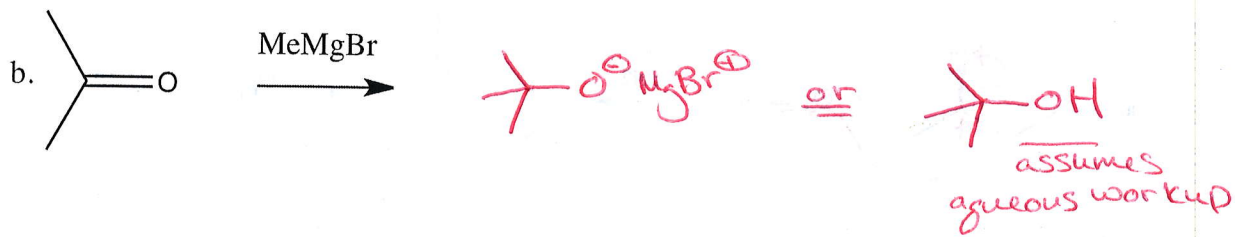
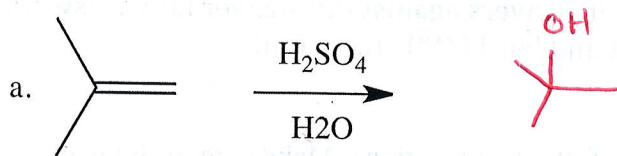
2. When 3-hexene is treated to  $\text{Br}_2$  followed by  $\text{NaNH}_2$ , an alkyne is formed. However, when cyclohexene is treated to the same conditions, a cyclohexadiene is formed. Explain this difference? (9 points)\*\*



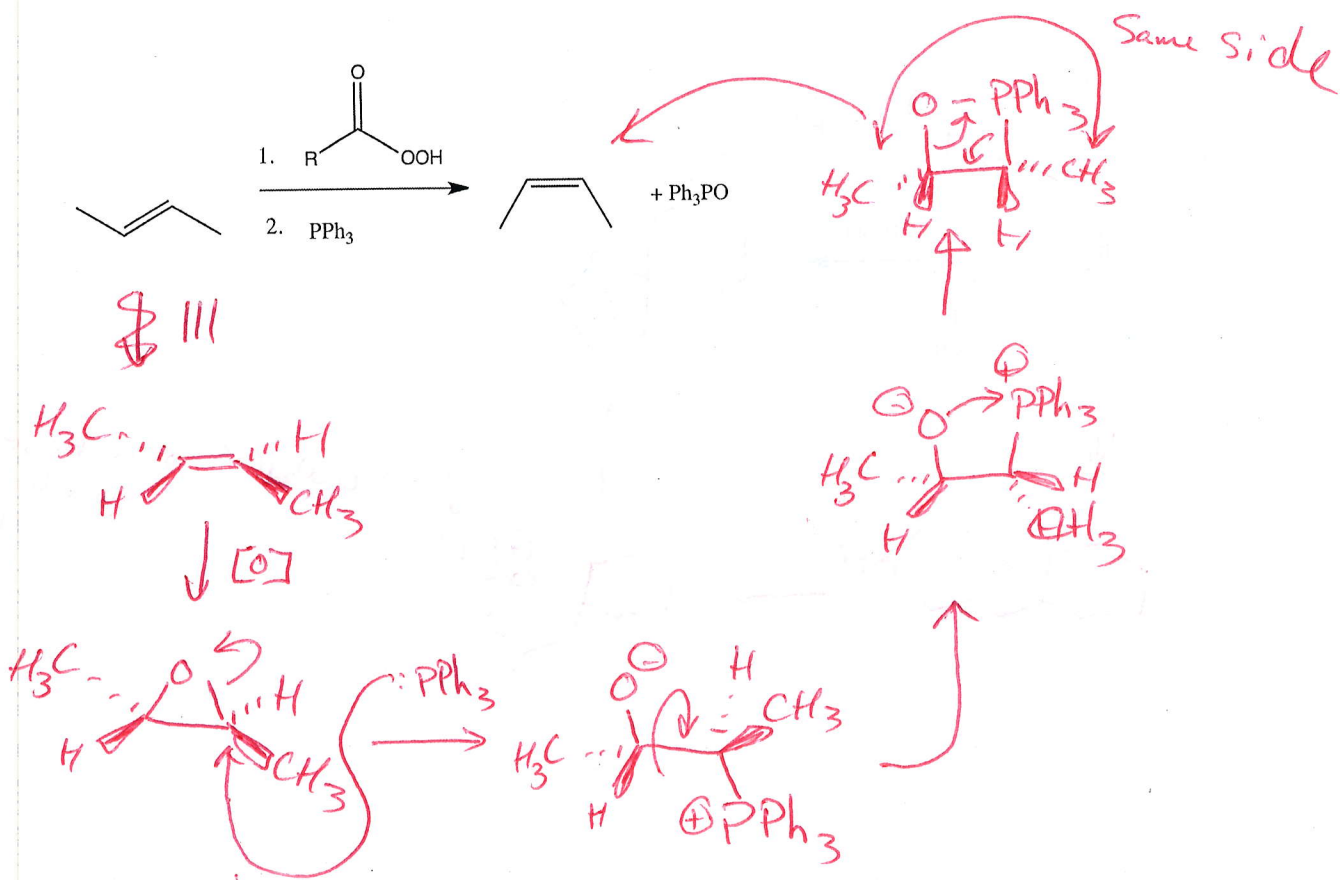




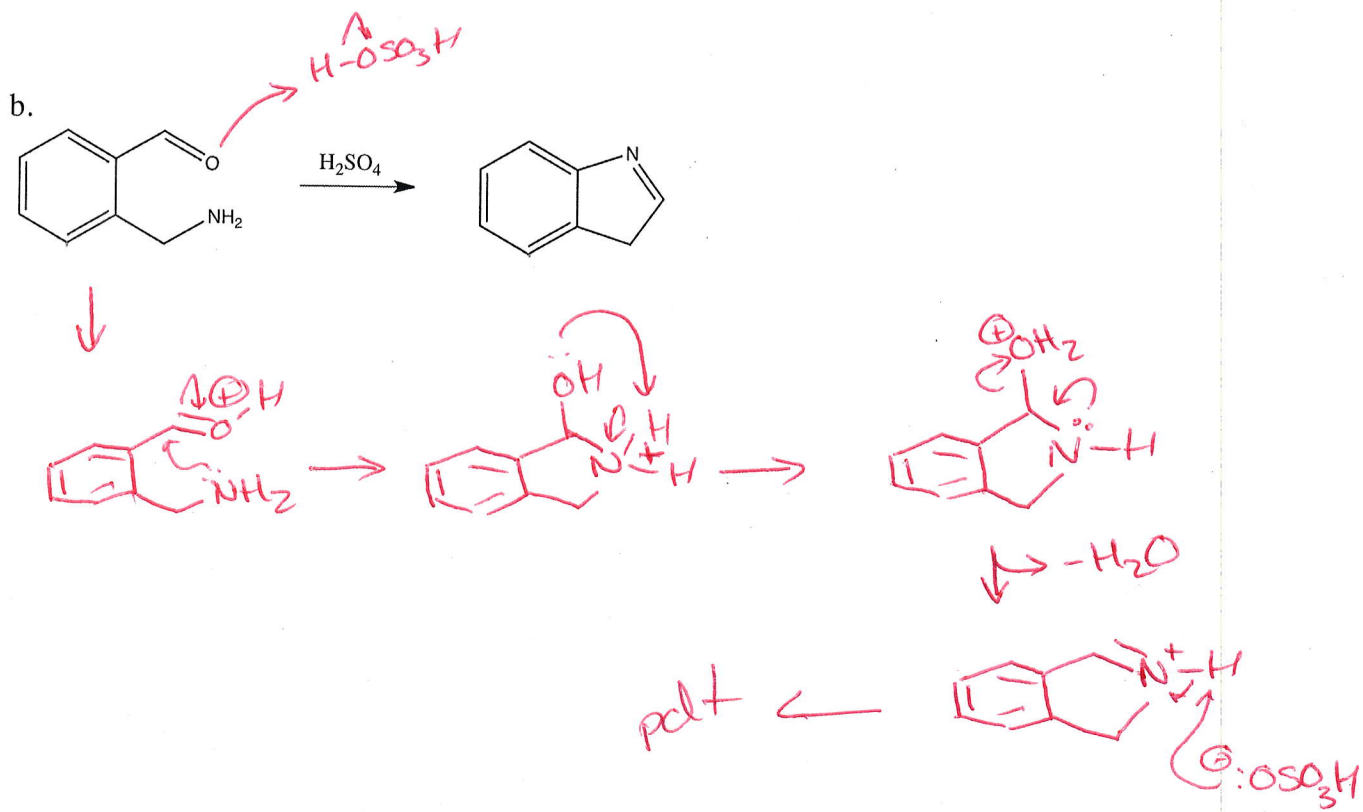
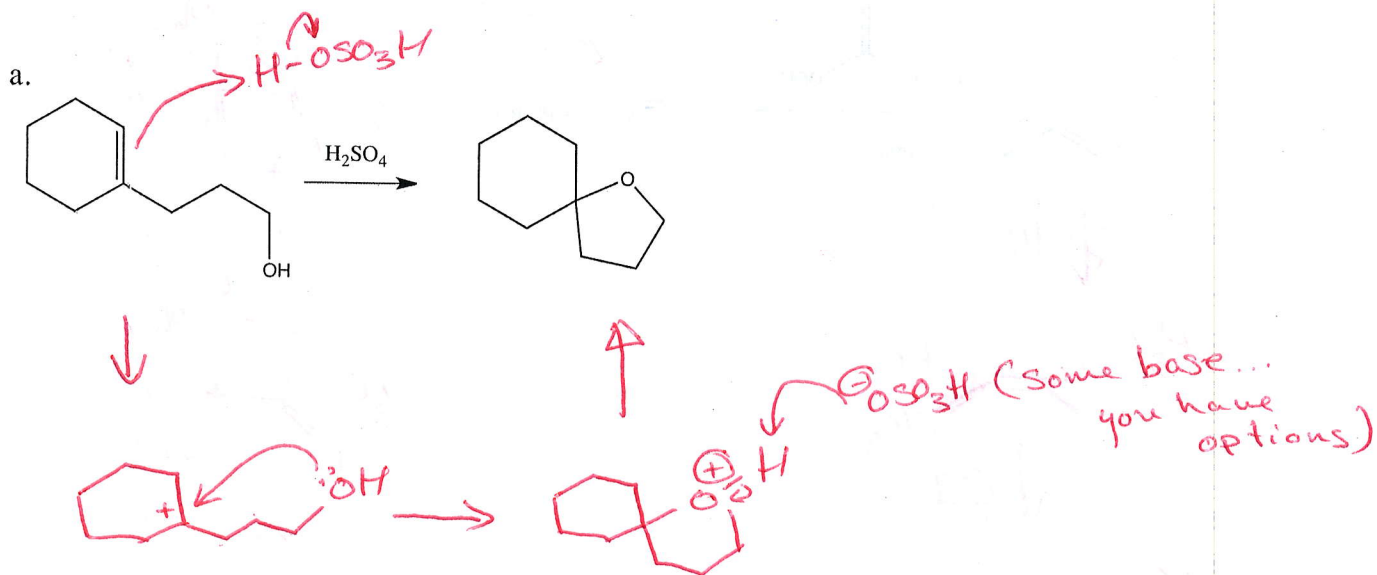
3. Show the products or reagents for the following reactions. Make sure to address stereochemistry when appropriate. (4 points each, 24 points). \*\*



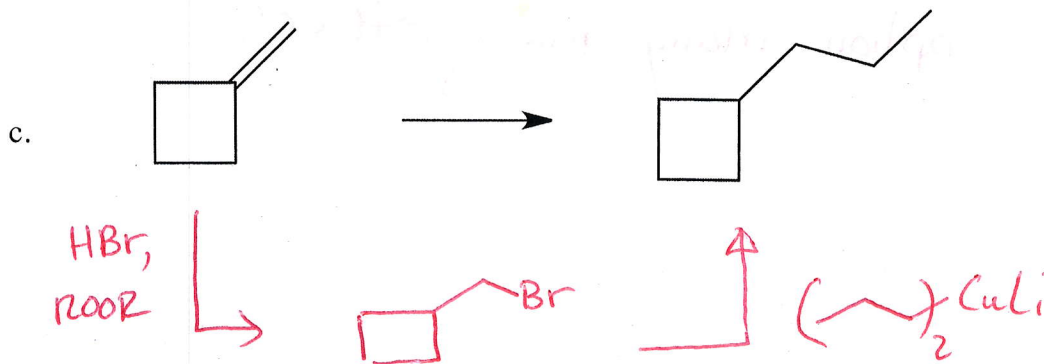
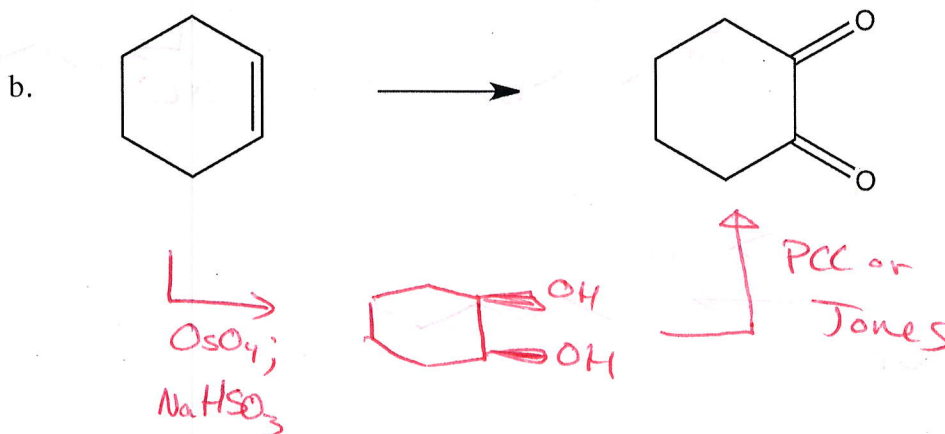
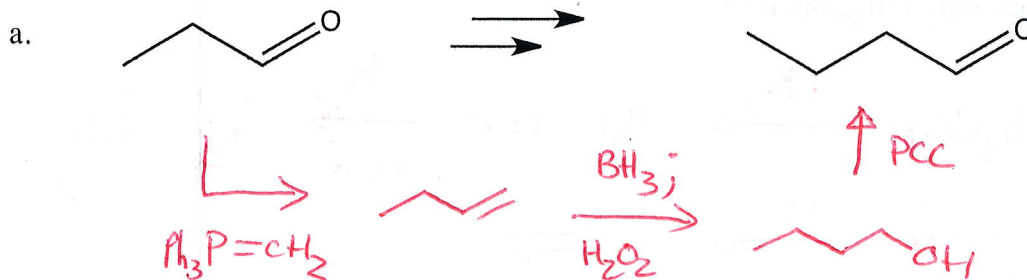
5. A *trans* double bond can be converted to a *cis* double bond by treatment of a peroxyacid followed by treatment with triphenylphosphine. Explain the stereochemical outcome of this process, using mechanisms throughout the second step (10 points)\*\*\*



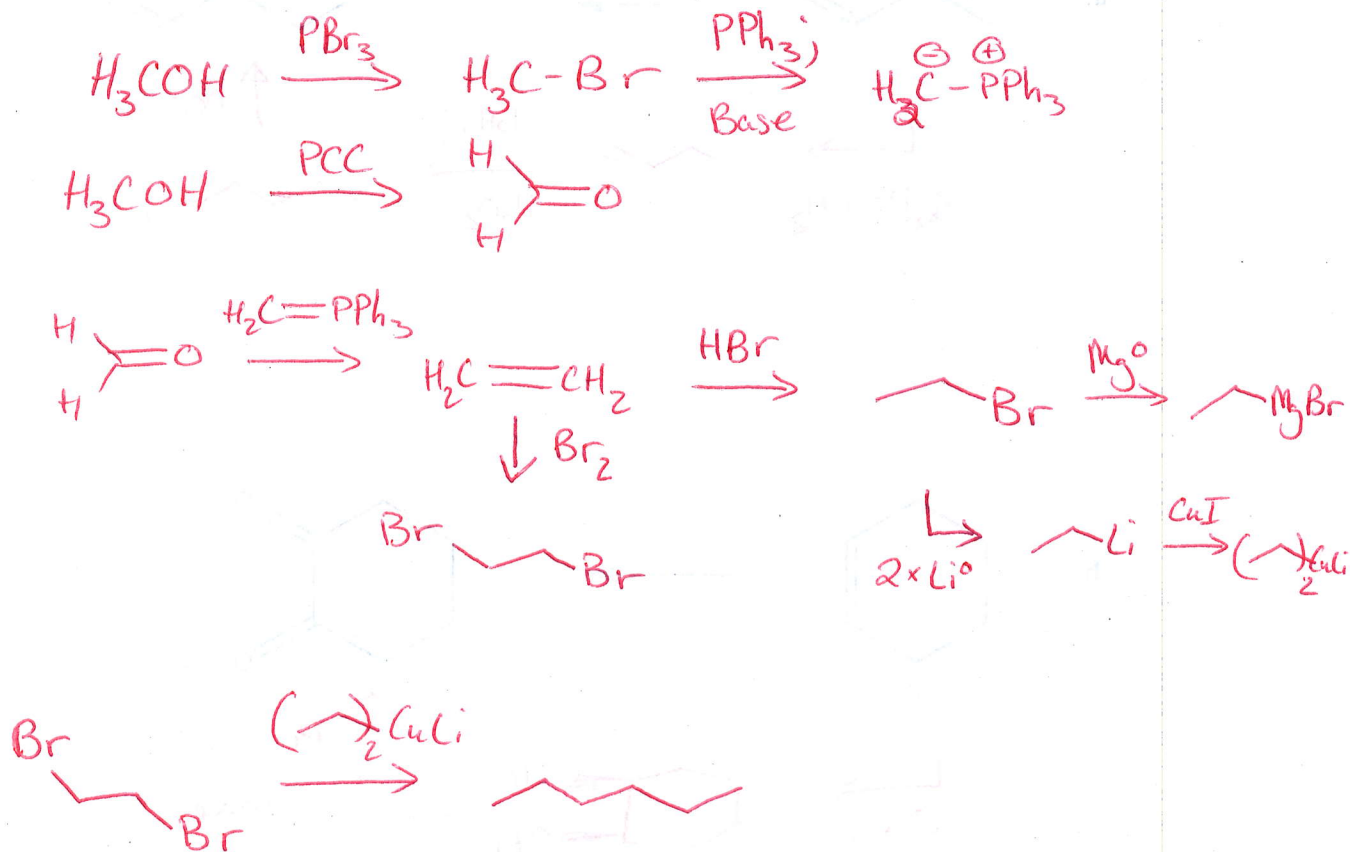
4. Show the mechanisms of the following reactions, using curved arrows to illustrate your reactions. (16 points, 8 points each)\*\*



6. The following syntheses can be carried out in 3 or fewer steps. Show a synthesis. (If you use more than 3 steps, it is ok). (7 points each, 21 points)\*\*



7. Show a synthesis of hexane using methanol ( $\text{H}_3\text{COH}$ ) as your only carbon-based starting materials. (10 points)\*\*\*



One option. Many, many others