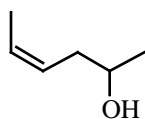
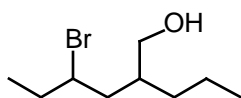
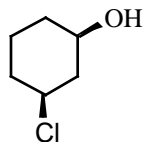


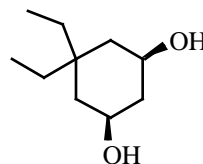
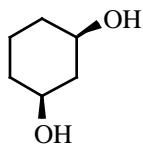
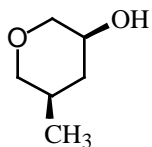
1. 2-Methyl-3-pentanol is classified as: (3 points)

- a. a primary alcohol b. a secondary alcohol c. a tertiary alcohol d. none of the above

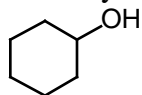
2. Provide acceptable names for the following: (10 points total)



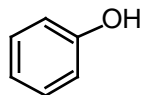
3. Circle the molecule with the highest boiling point. Put a square around the molecule with the highest water solubility. (4 points)



4. Rank the acidity of the following molecules, from 1 (strongest) to 4 (weakest). Explain very briefly why **A** and **B** have very different acidities.



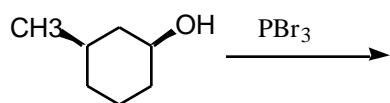
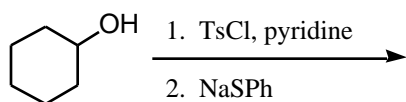
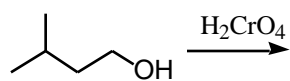
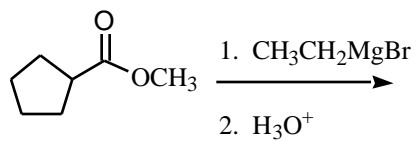
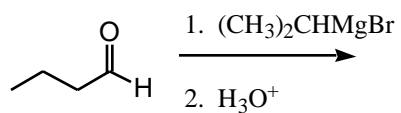
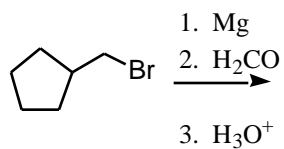
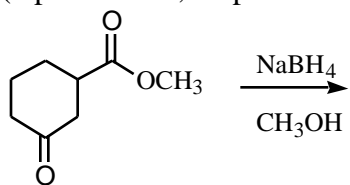
A



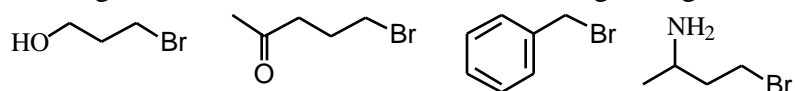
B



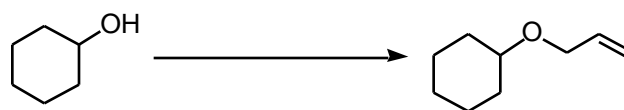
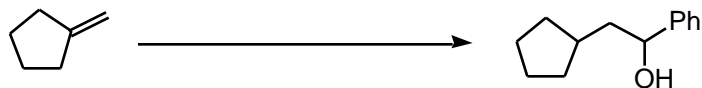
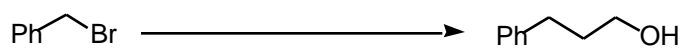
5. Draw the major products for the following reactions. (Assume excess quantities of reagents.)
(3 points each, 21 points total)



6. Which of the following would be suitable to use when forming a Grignard reagent? (3 points)

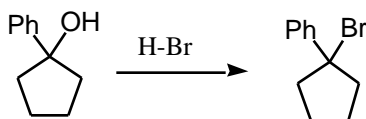
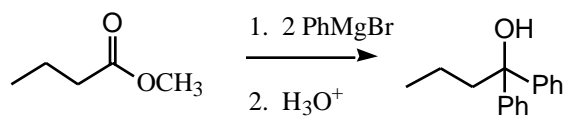


7. Provide the reagents necessary to accomplish the following transformations (5 each, 20 total)



8. Draw a possible structure for an achiral molecule **A** with formula $C_5H_{12}O$, given that when H_2CrO_4 is added to **A** the solution turns green, and that the Lucas test with **A** takes about 3-4 minutes. (5 points)

9. Draw the mechanisms for the following transformations. Identify the slow step in each mechanism. (6 points each)



10. Design syntheses of the following, starting from alcohols of 4 carbons. (7 points each)

