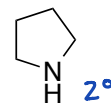
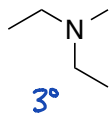
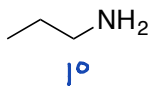
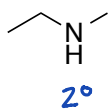


# Answer Key

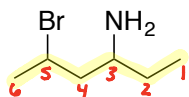
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### Chapter 24 - Problem Set

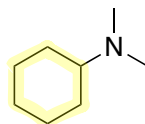
1) Classify each amine as primary, secondary, or tertiary.



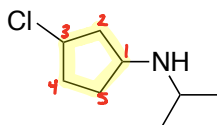
2) Give the IUPAC name for each compound shown below.



5-bromo-3-hexanamine

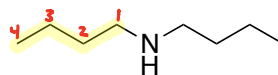


N,N-dimethylcyclohexanamine

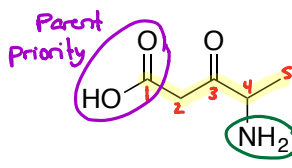


3-chloro-N-isopropylcyclopentanamine

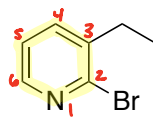
can include 1-, but not necessary



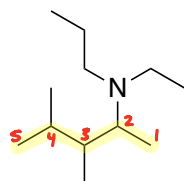
N-butyl-1-butanamine



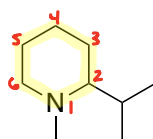
4-amino-3-oxopentanoic acid



2-bromo-3-ethylpyridine

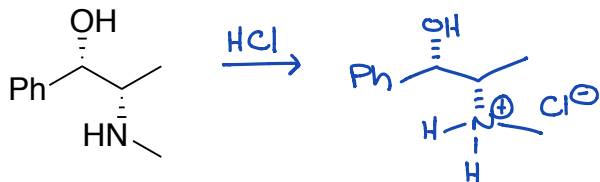


N-ethyl-3,4-dimethyl-N-propyl-2-pentanamine

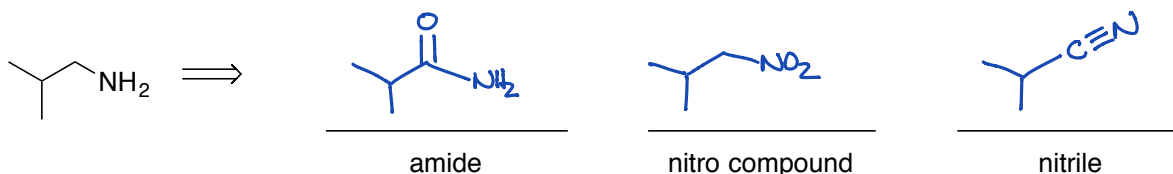


2-isopropyl-1-methylpiperidine

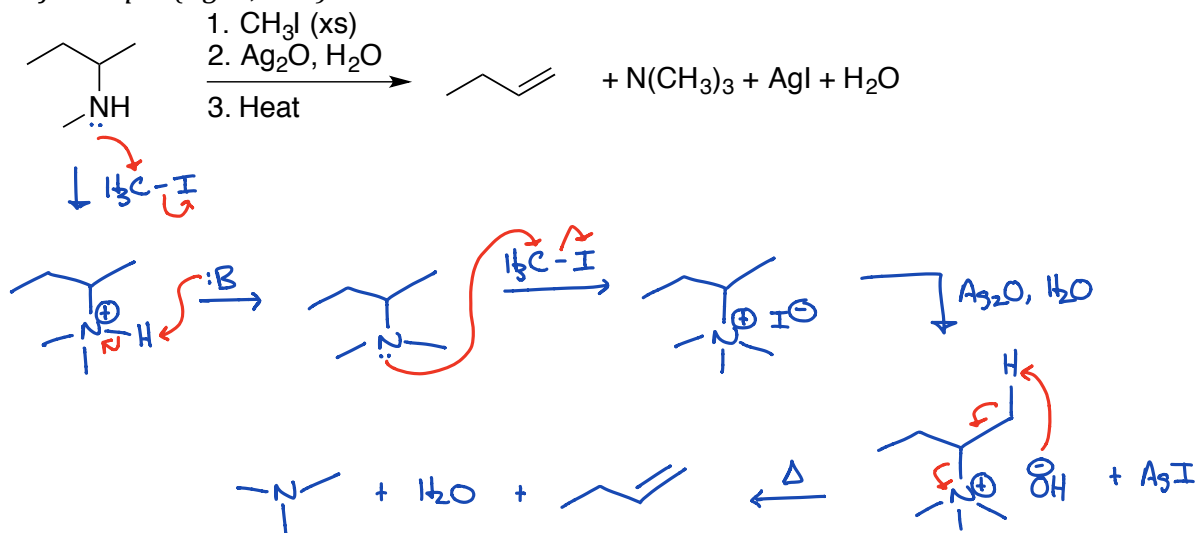
3) The structure of pseudoephedrine is shown below. Show a valid reaction for the conversion of pseudoephedrine to the hydrochloride salt. Be sure to include both the required reagent(s) and the product. (3 points)



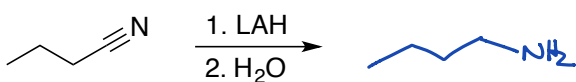
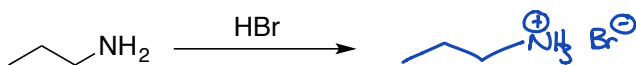
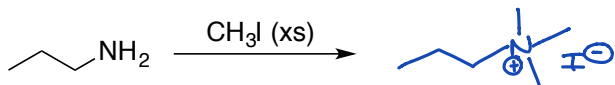
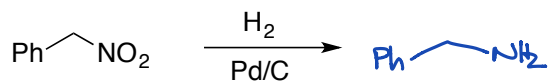
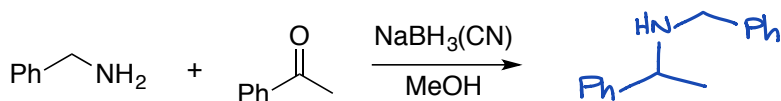
- 4) The amine below can be prepared by reducing an amide, a nitro compound, or a nitrile. Show the structure for each of these three potential starting materials.



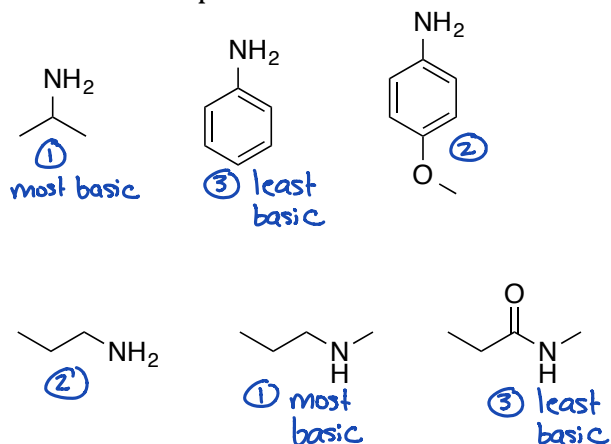
- 5) Provide a full arrow pushing mechanism for the reaction shown below. *Note: You do not need to show any arrows for step 2 ( $\text{Ag}_2\text{O}, \text{H}_2\text{O}$ ).*



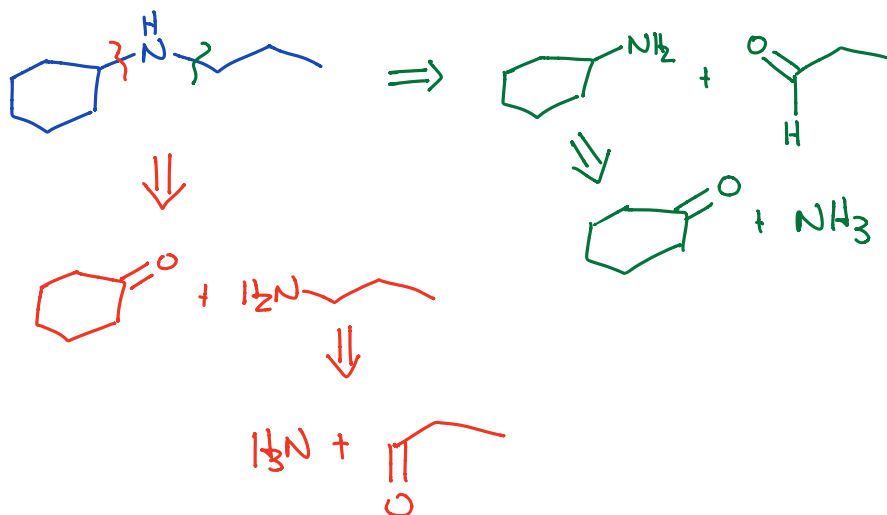
- 6) Predict the major product for each reaction below.



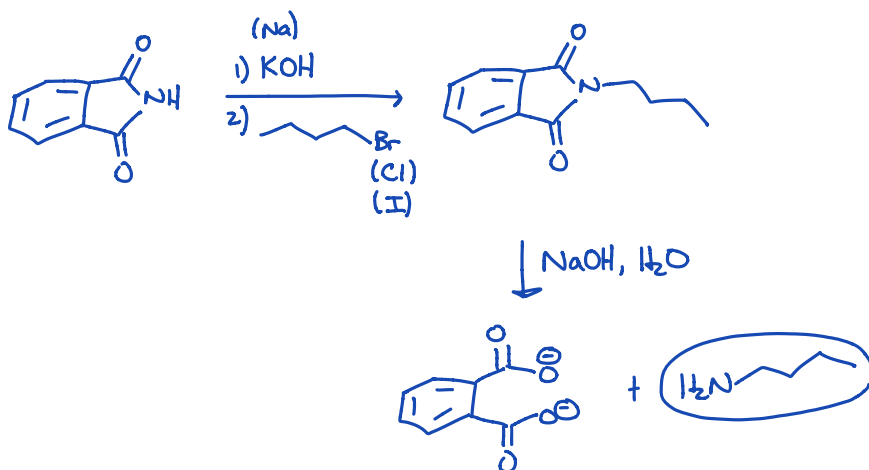
7) Rank the compounds in each set below in order of increasing basicity.



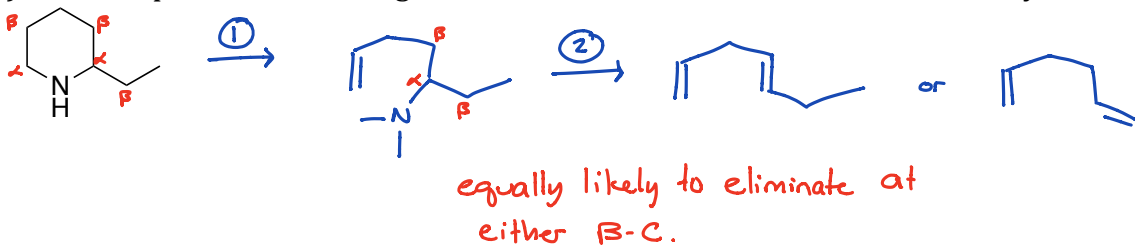
8) Show how cyclohexylpropylamine can be prepared via reductive amination starting with ammonia. Show the mechanism for the one of the reductive amination steps. \*Note: Order does not matter. You can make either cyclohexylamine or propyl amine first.



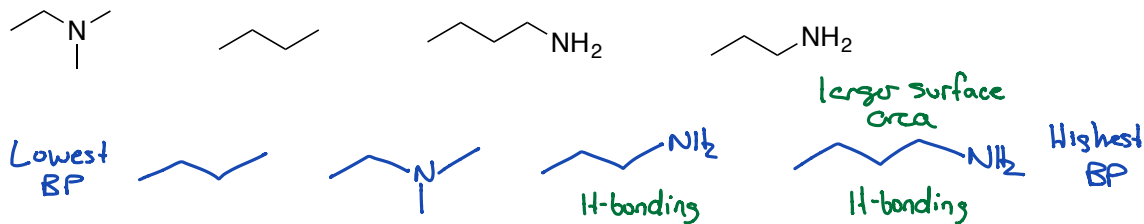
9) Show how butylamine can be prepared via the Gabriel Amine Synthesis.



10) Show the products following a series of two Hoffman eliminations of the cyclic amine below.



11) Rank the compounds below in order of increasing boiling point.



12) Write the complete electron pushing mechanism for the reductive amination of benzaldehyde and methylamine.

