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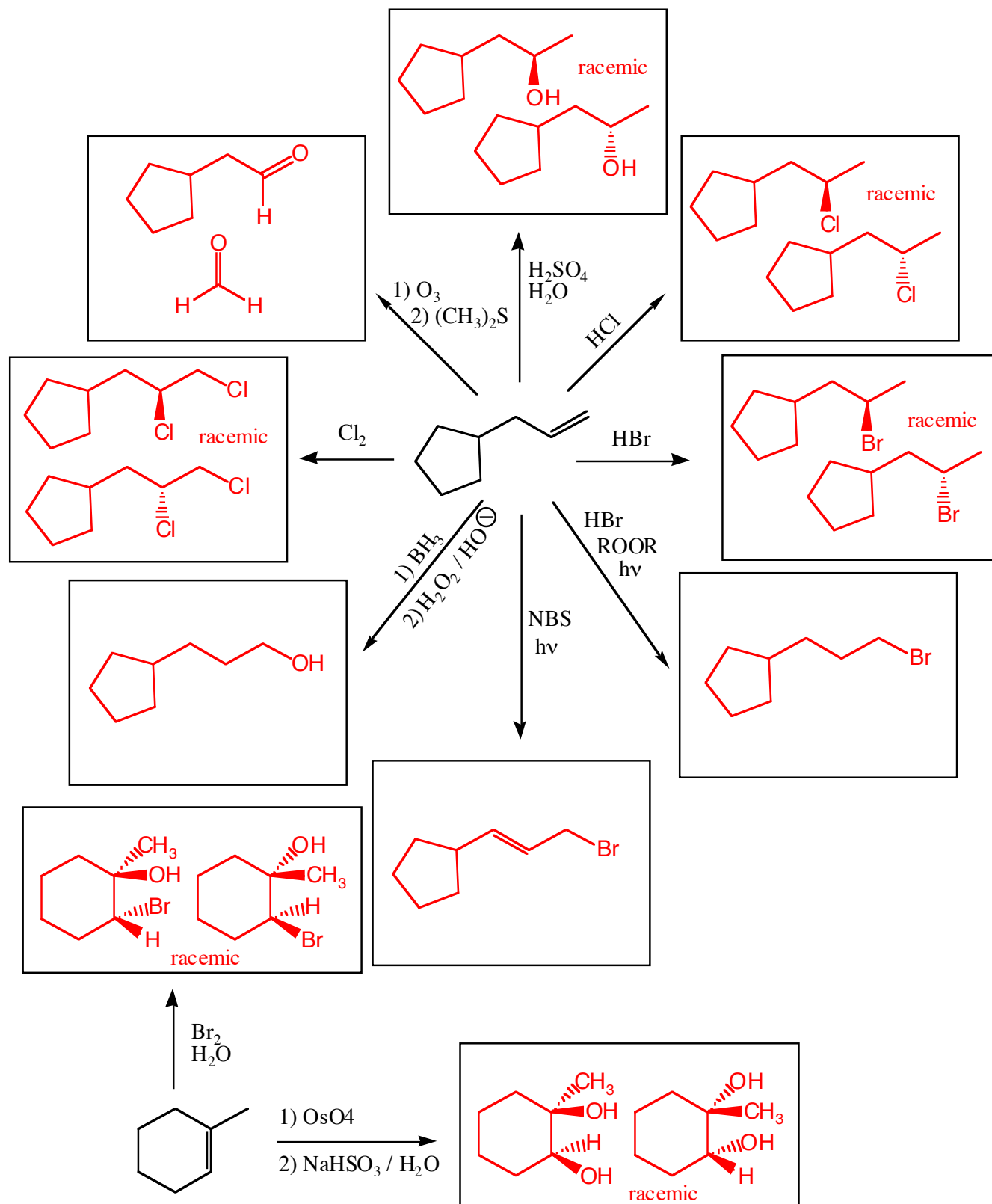
SIGNATURE: _____

**Chemistry 320M/328M
Dr. Brent Iverson
Practice Homework
December 1, 2025**

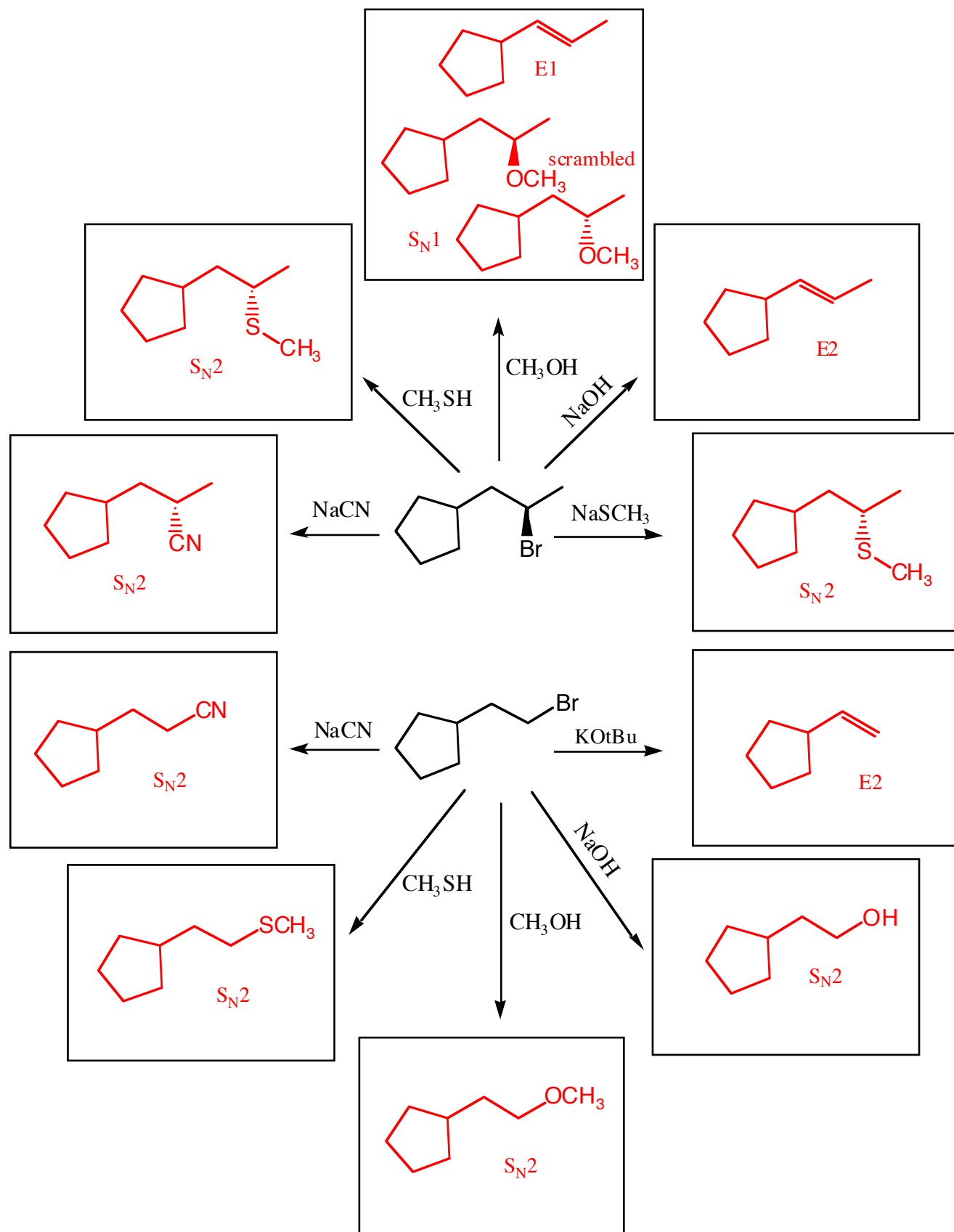
**Please print the
first three letters
of your last name
in the three boxes**

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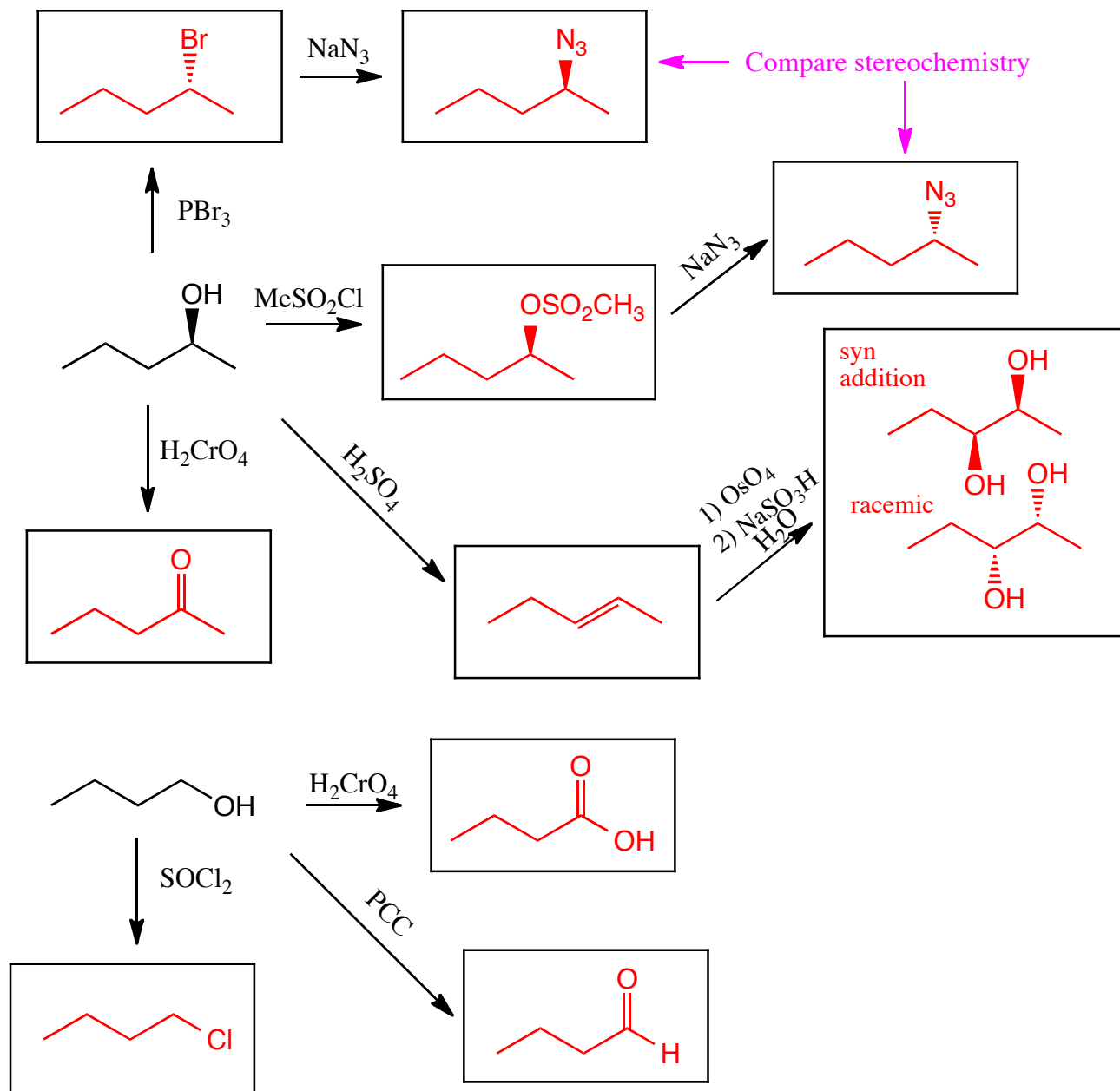
Fill in the boxes with the structures that complete the reactions. Use wedges and dashes to indicate stereochemistry when appropriate.



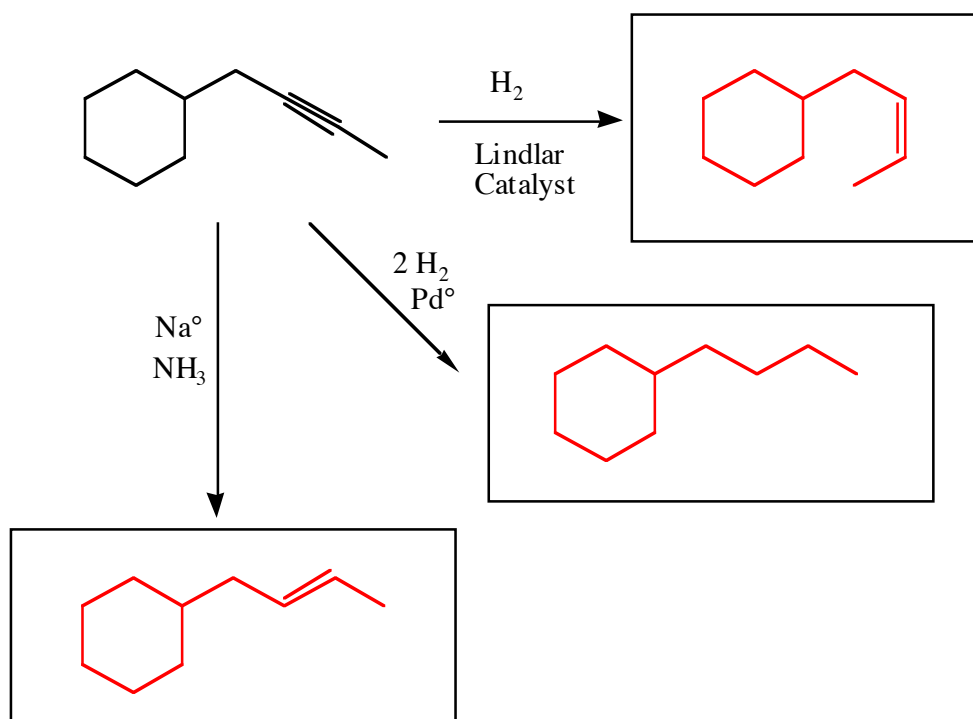
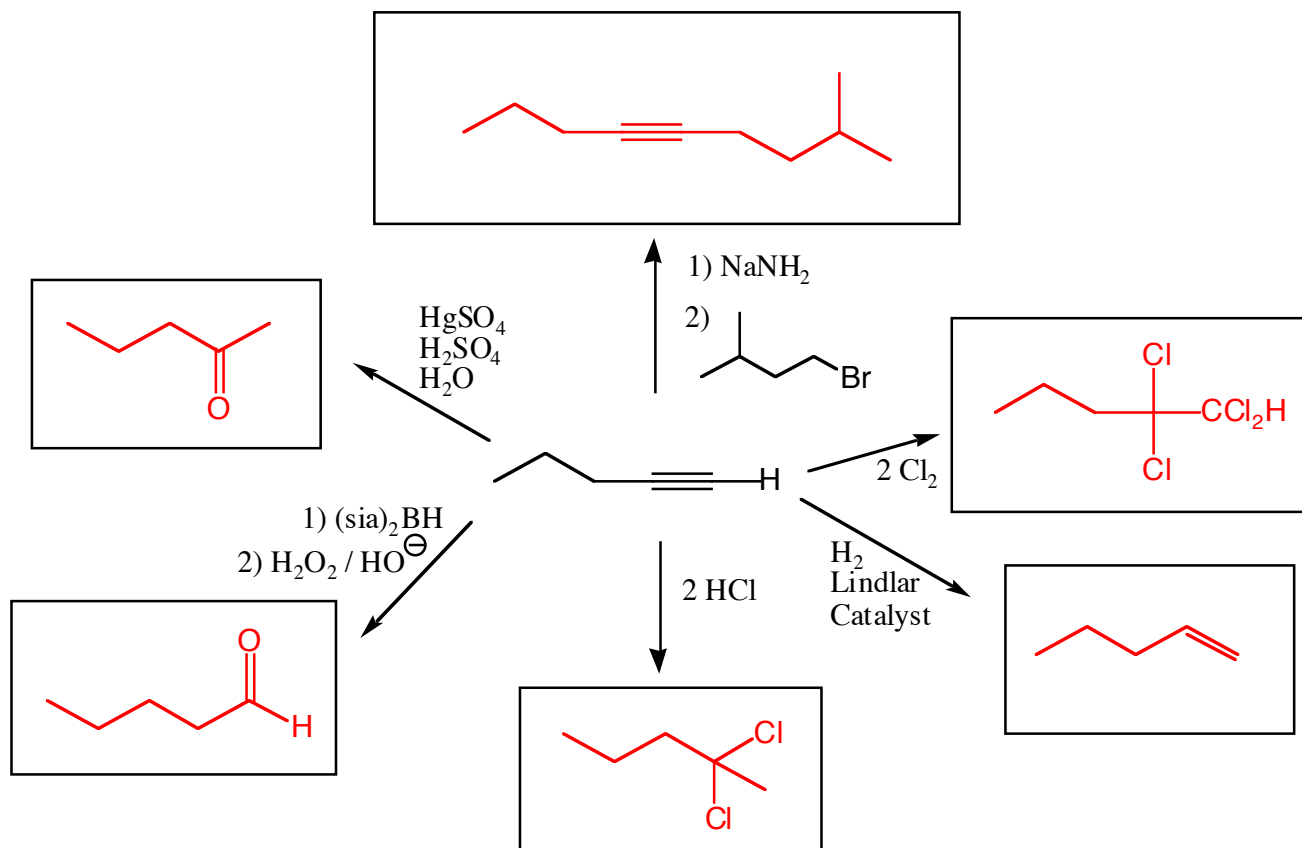
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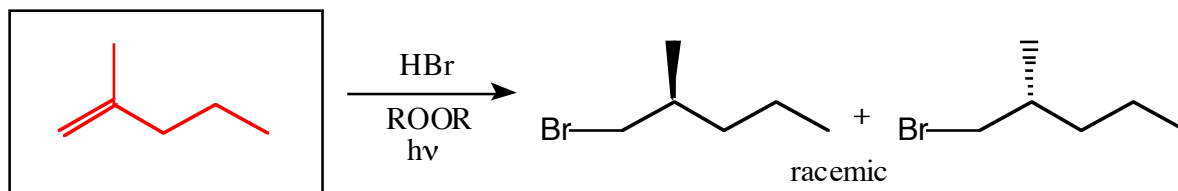
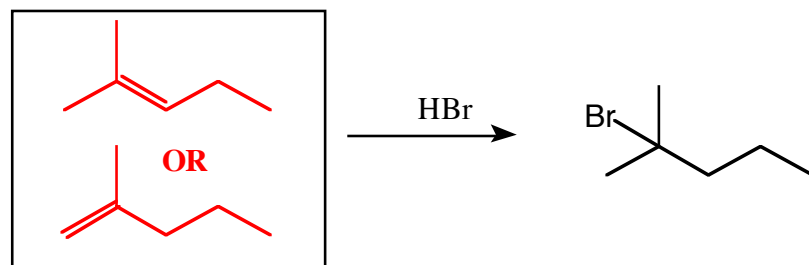
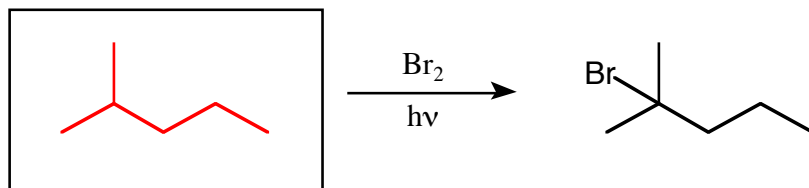
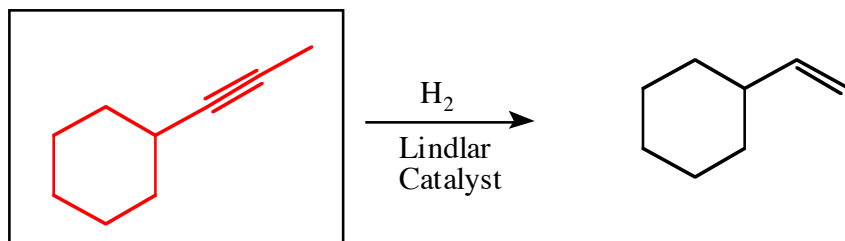
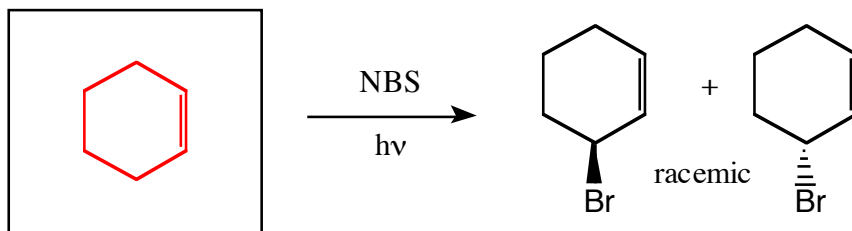
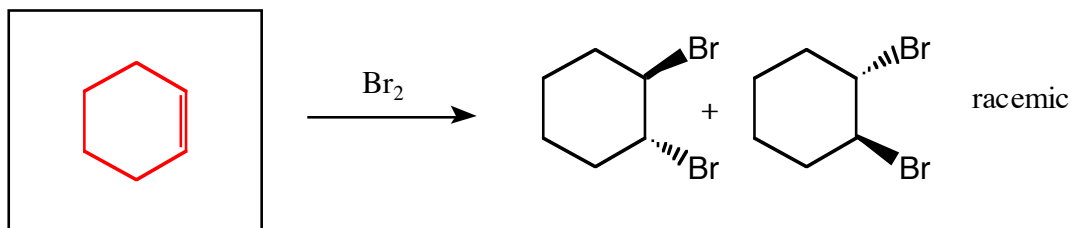
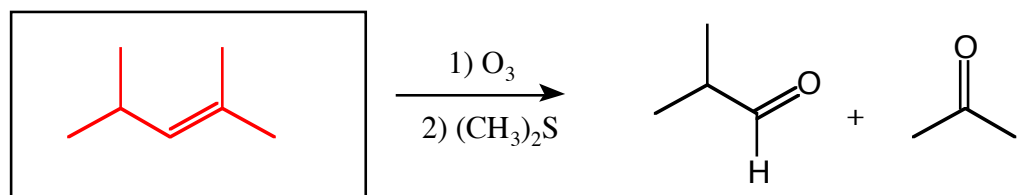
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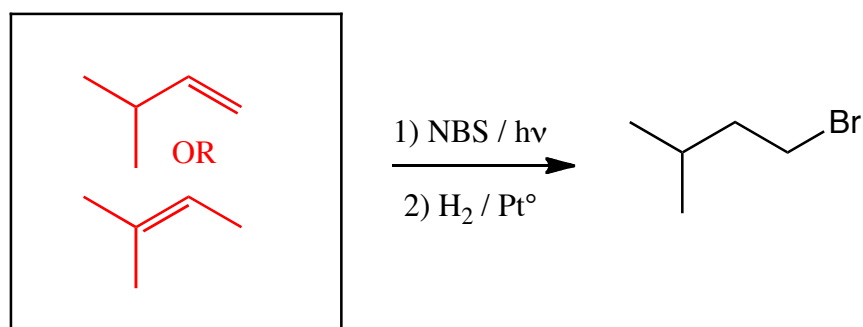
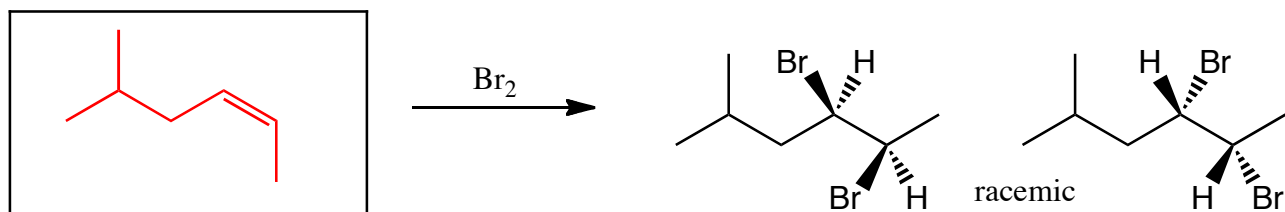
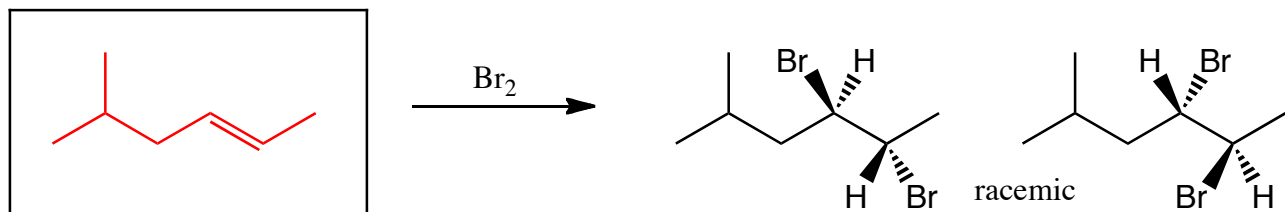
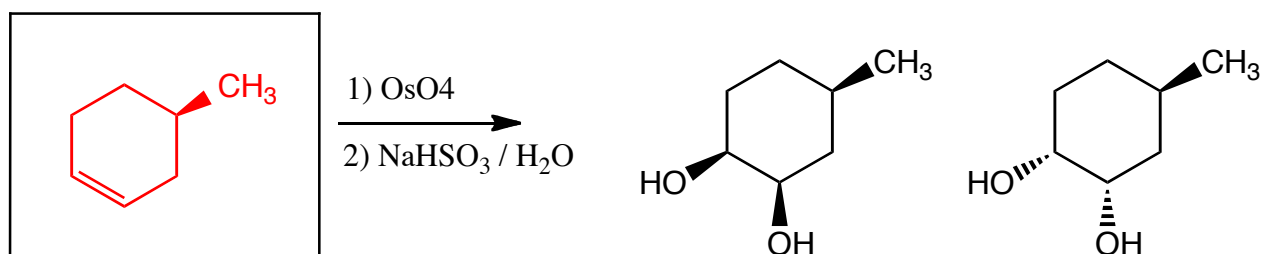
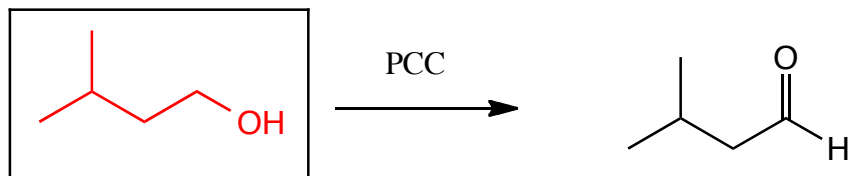
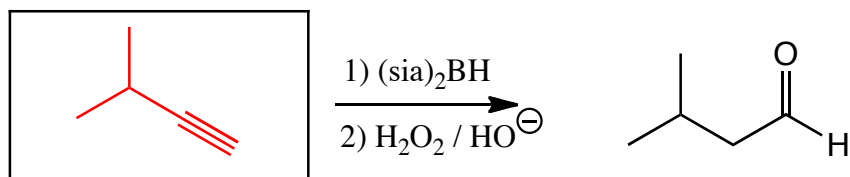
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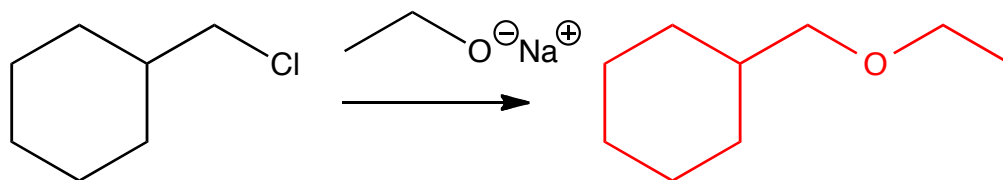
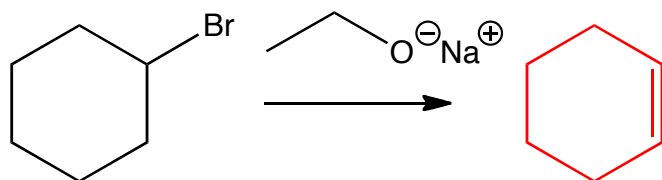
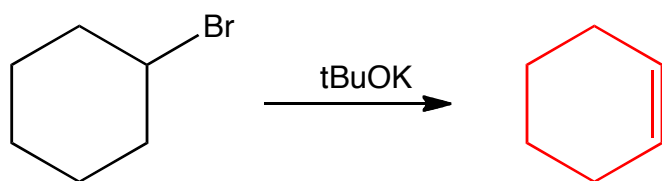
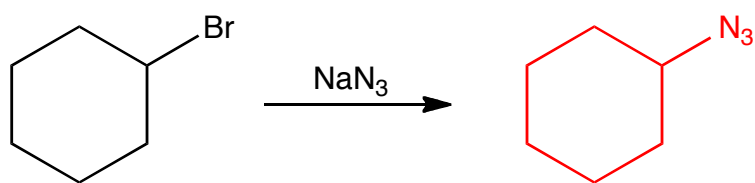
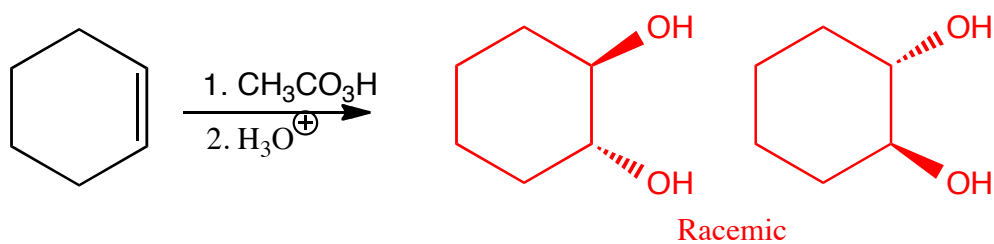
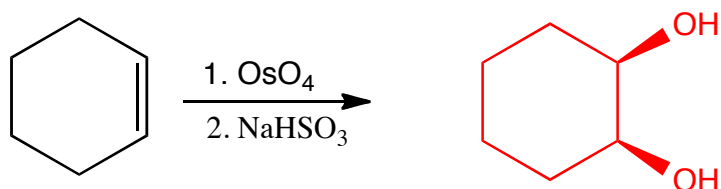
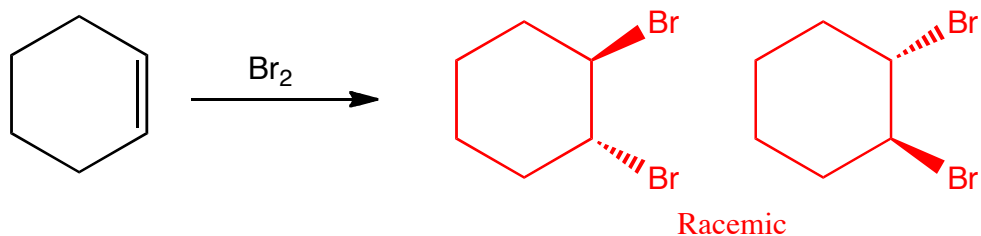
Fill in the boxes with the structures that complete the reactions. Use wedges and dashes to indicate stereochemistry when appropriate. This format is intended to get you more comfortable with working backwards in synthesis problems.



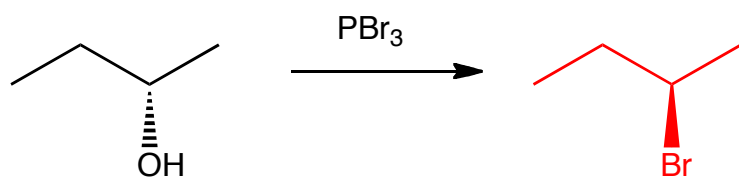
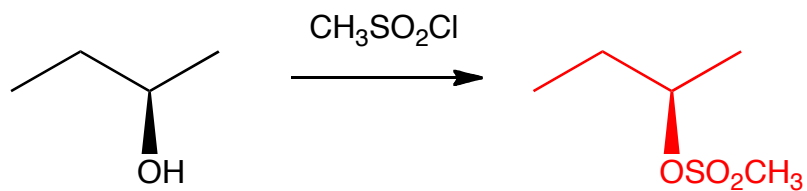
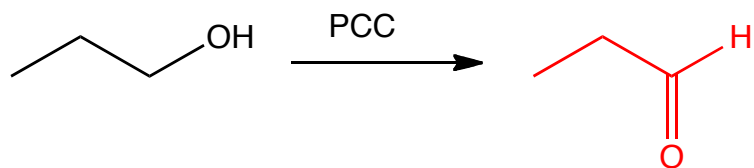
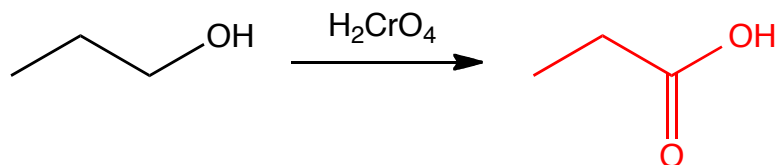
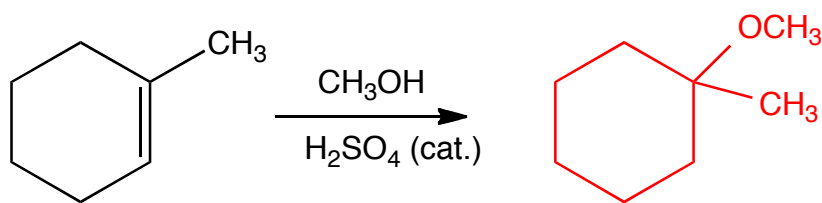
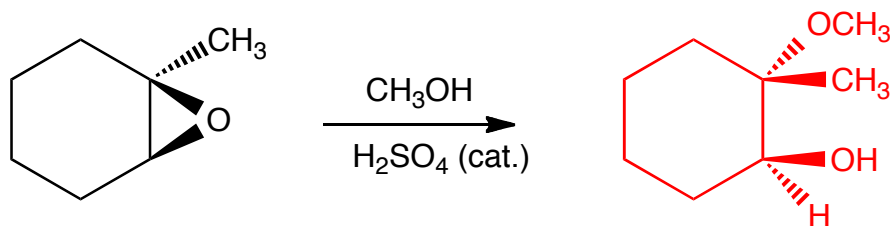
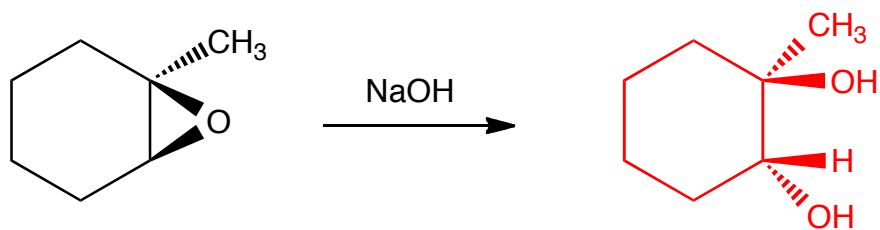
Fill in the boxes with the structures that complete the reactions. Use wedges and dashes to indicate stereochemistry when appropriate. This format is intended to get you more comfortable with working backwards in synthesis problems.



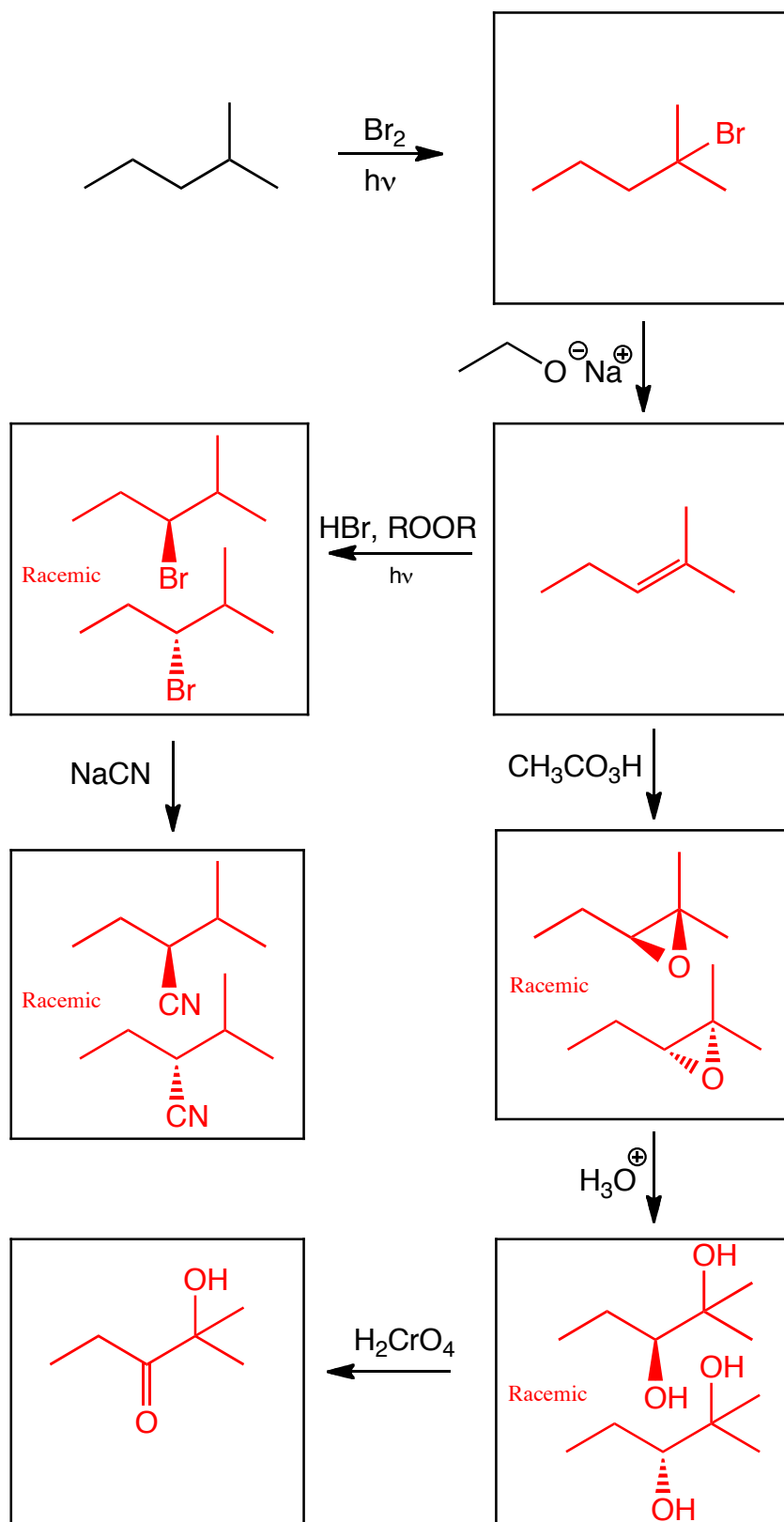
(3 or 5 pts each) Draw structures to complete the reactions. Use wedges and dashes to indicate stereochemistry and be sure to write racemic when appropriate.



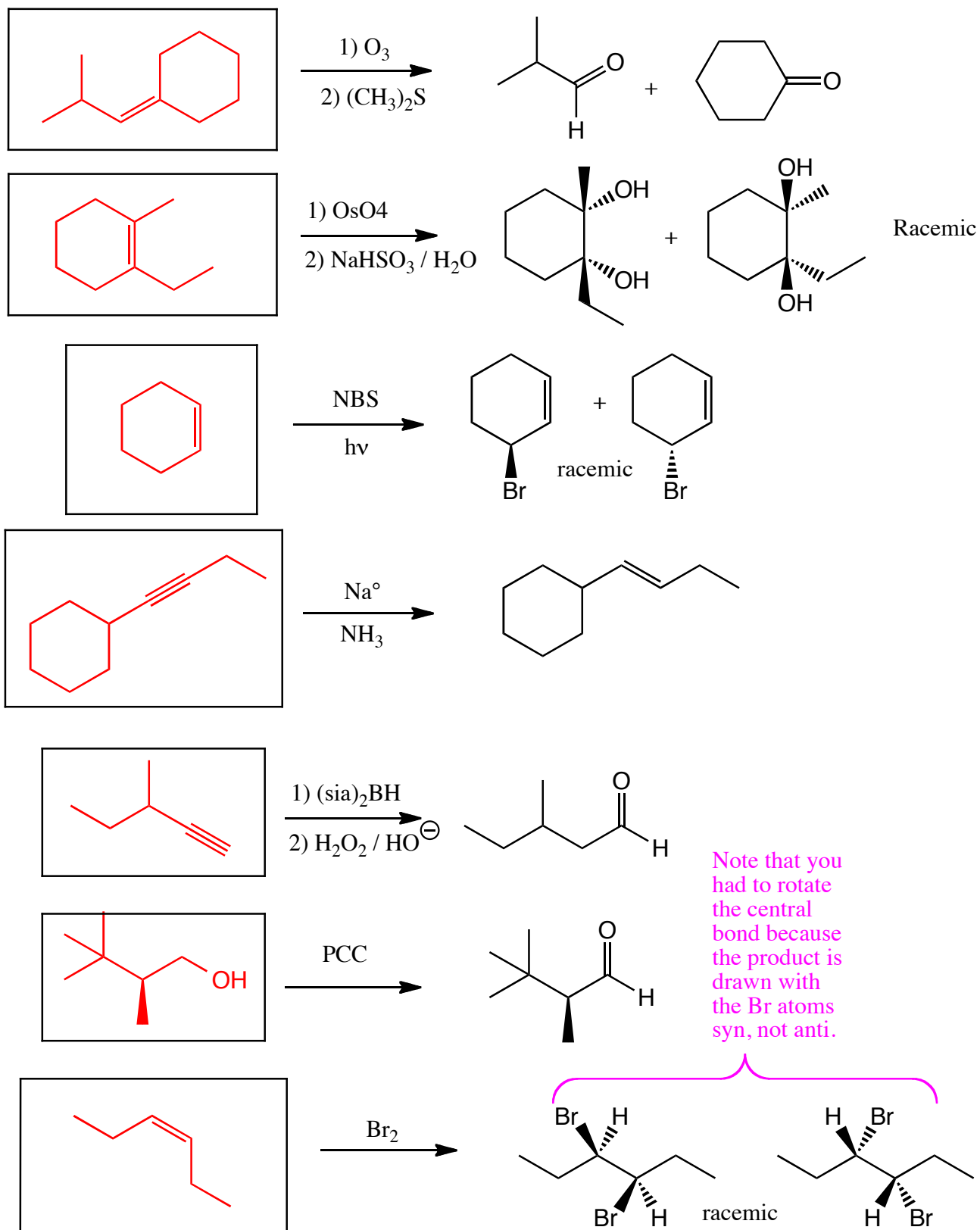
(3 or 5 pts each) Draw structures to complete the reactions. Use wedges and dashes to indicate stereochemistry and be sure to write racemic when appropriate.



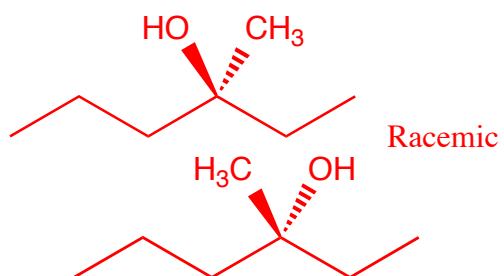
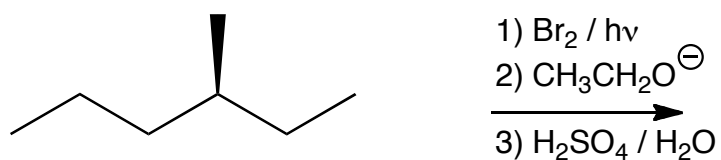
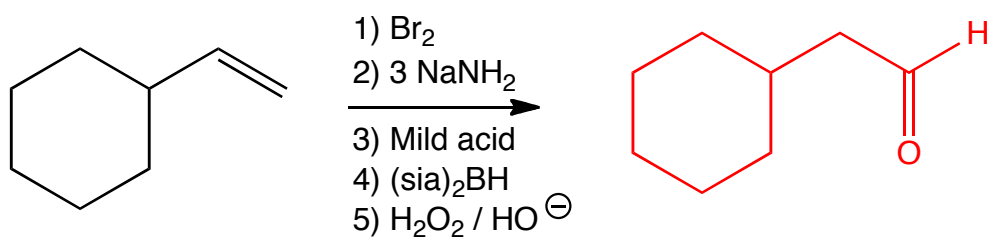
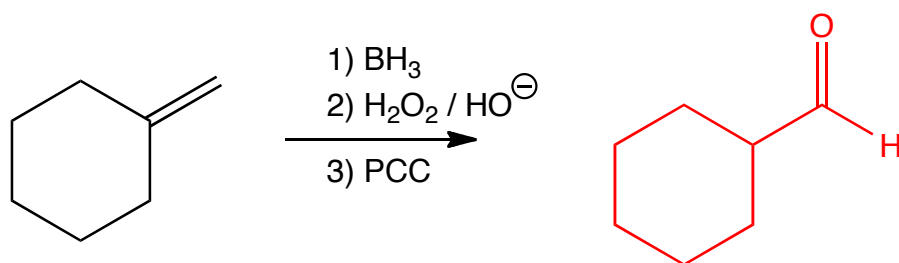
(3 or 5 pts each) Draw structures in the boxes to complete the reactions. Use wedges and dashes to indicate stereochemistry and be sure to write racemic when appropriate.



(3 pts each) Fill in the boxes with the structures that complete the reactions. Use wedges and dashes to indicate stereochemistry when appropriate. This format is intended to get you more comfortable with working backwards in synthesis problems.



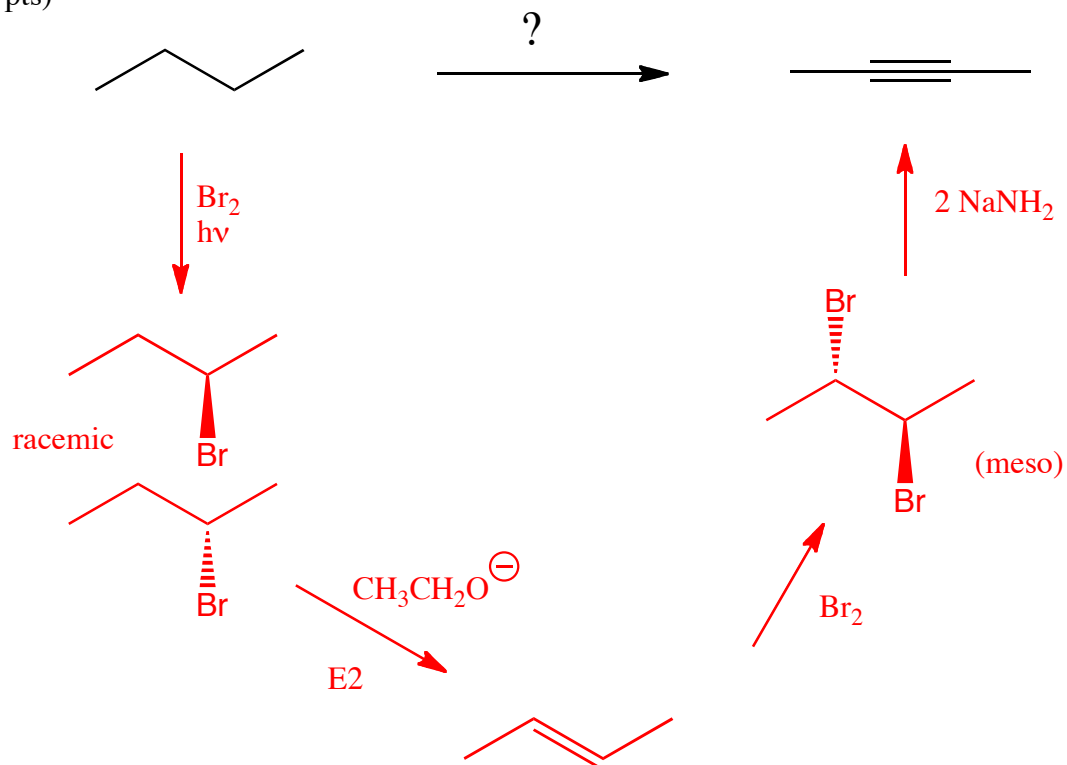
(7-9 pts each) Draw structures for the product(s) of the following series of reactions. Use wedges and dashes to indicate stereochemistry when appropriate. This format is intended to get you more comfortable with working backwards in synthesis problems.



These are synthesis questions. You need to show how the starting material can be converted into the product(s) shown. You may use any reactions we have learned. Show all the reagents you need. Show each molecule synthesized along the way and be sure to pay attention to the regiochemistry and stereochemistry preferences for each reaction.

Remember, when doing synthesis problems you should 1) count carbon atoms in the product and starting material(s), 2) work backwards and 3) RECOGNIZE key features of a molecule that help you predict the reaction used to construct it.

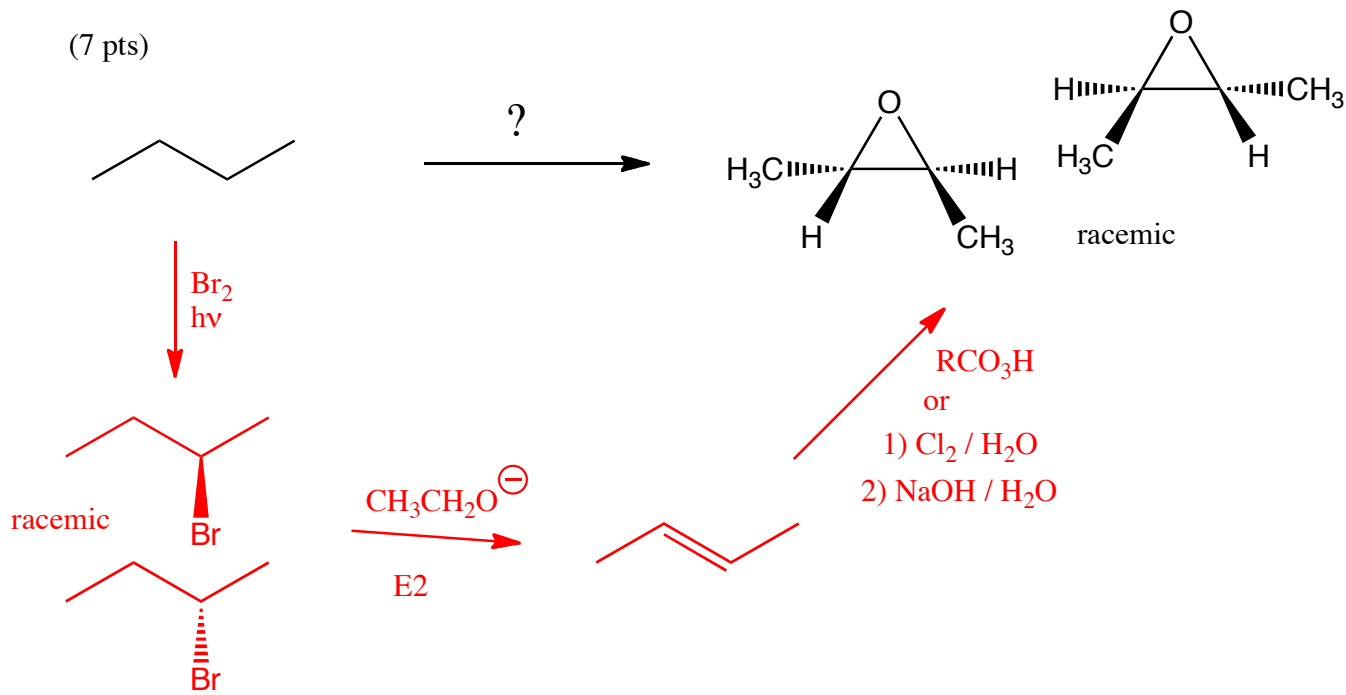
(10 pts)



This was a warm-up, and we wanted you to recognize this as being right down I-35 on the 310M roadmap!

You need to show how the starting material can be converted into the product(s) shown. You may use any reactions we have learned. Show all the reagents you need. Show each molecule synthesized along the way and be sure to pay attention to the regiochemistry and stereochemistry preferences for each reaction.

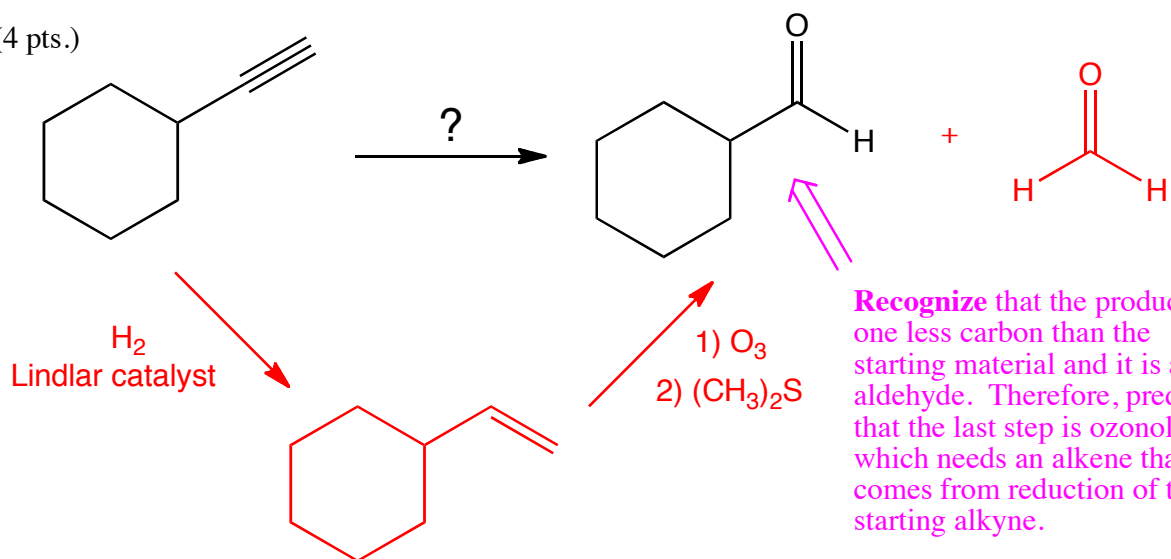
(7 pts)



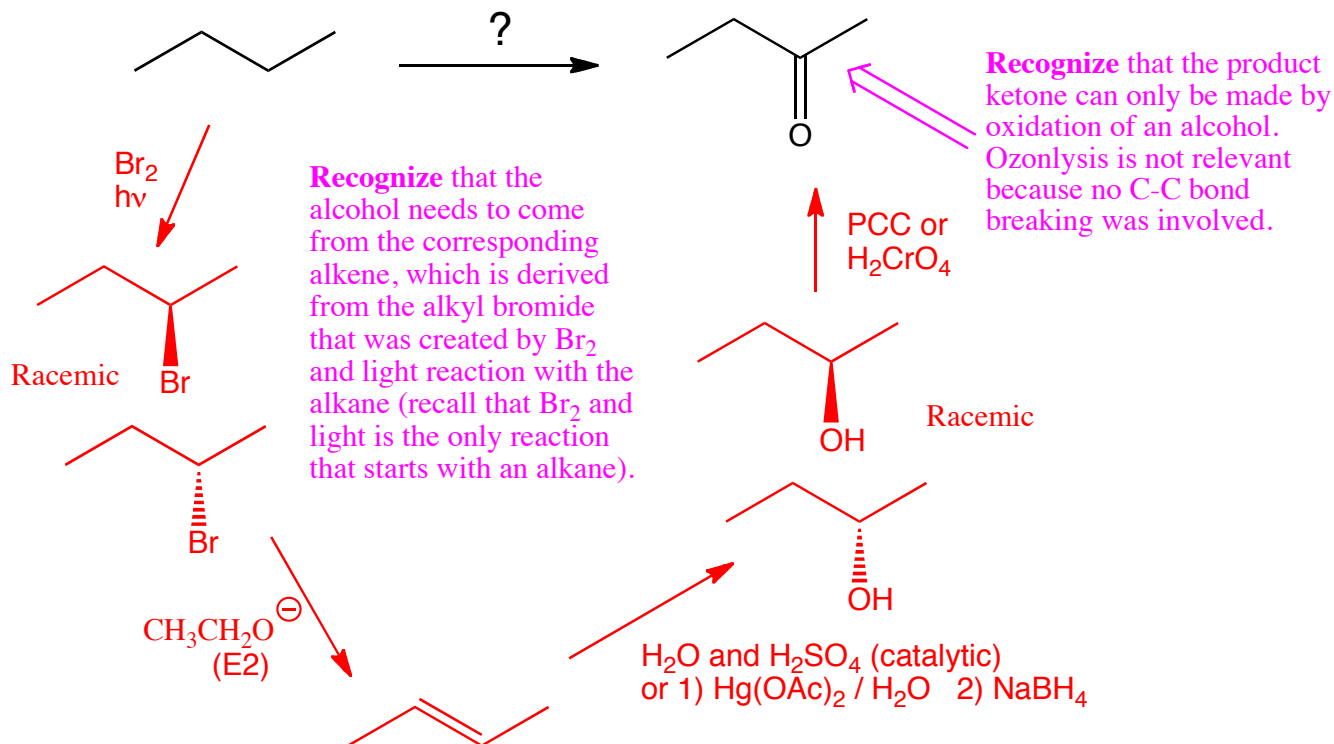
This was very similar to the first one, we just wanted to remind you of the reagents (RCO_3H or 1) $\text{Cl}_2/\text{H}_2\text{O}$ 2) $\text{NaOH}/\text{H}_2\text{O}$) that produce an epoxide from an alkene. Of these, the RCO_3H approach is much preferred by chemists because of its ease and generality.

You need to show how the starting material can be converted into the product(s) shown. You may use any reactions we have learned. Show all the reagents you need. Show each molecule synthesized along the way and be sure to pay attention to the regiochemistry and stereochemistry preferences for each reaction.

(4 pts.)



(9 pts.)



As a perfectly acceptable alternative strategy, you could make 2-butyne as described in the first part of this question on page 14, then create the ketone product using the mercury reagents or the borane approach.

You need to show how the starting material can be converted into the product(s) shown. You may use any reactions we have learned. Show all the reagents you need. Show each molecule synthesized along the way and be sure to pay attention to the regiochemistry and stereochemistry preferences for each reaction. All of the carbon atoms of the product must come from the starting material.

