Introduction: Try to work on these on your own; if necessary, you may consult with others about a given problem, but you alone, ultimately, are responsible for your own understanding. Answers after we return from break (or maybe during that week.)

1) Write resonance structures for each of the following:

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H
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H
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D
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2) Draw all possible cationic intermediates in the reaction shown below. Which of the structures are resonance forms? Identify the most and least stable structures.

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HCl
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3a) When 2-phenyl-2-butene is treated with H₂SO₄/H₂O a compound with the molecular formula C₂₀H₂₄ is formed as a side product. Suggest a structure for this compound and provide a mechanistic explanation to account for its formation.

b) What is the structure of the major product?

4) Suggest efficient reaction sequences for the preparation of each of the following compounds from the indicated starting materials and any other necessary reagents.

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OH
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from

a)
5) Complete the following reaction sequence by adding the appropriate reagents (a, b) and product (B).

6) Provide a mechanistic explanation for the following conversion:

7) (+)-3-Carene is a readily available, optically active natural product that is often used as a “chiral building block” in organic synthesis. Using 3-carene as your starting material, provide synthetic routes to the following compounds: