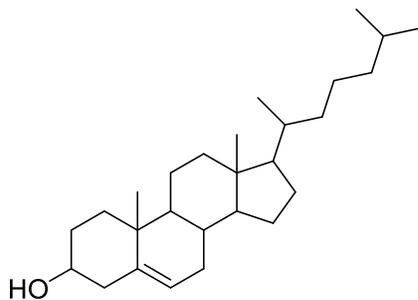
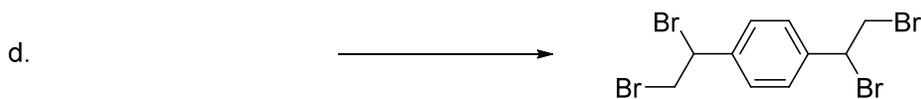
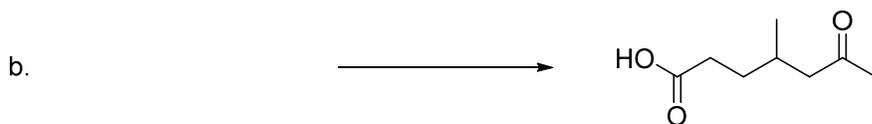
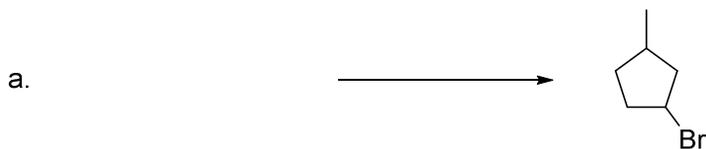


- 1) Show all the possible constitutional isomers of formula C_8H_{14} that you could hydrogenate to form propylcyclopentane (ignoring E/Z stereoisomers). Do not repeat any structures. (12 pts)

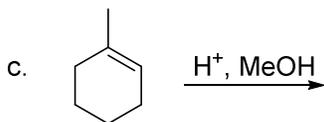
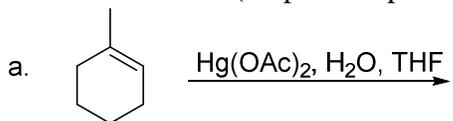
- 2) Label all eight asymmetric carbons in cholesterol, shown below. You do not need to assign R/S descriptors. How many stereoisomers are possible for a molecule with this many asymmetric carbons? (Just leave it as an exponent – no need to actually solve for the number.) (10 pts)



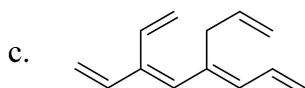
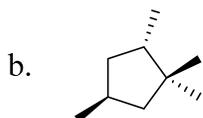
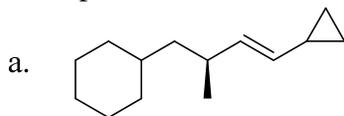
- 3) Using any reactions that have been covered so far in class, show how you would create the products shown, starting with any hydrocarbon (consisting of C and H only) that has the same number of carbon atoms as the product. Write your starting material before the arrow, and the other reagents above or below the arrow. Make sure that each reaction gives the desired structure as the only major product. Hint: D is an isotope of H and reacts the same way. (25 pts - 5 pts each)



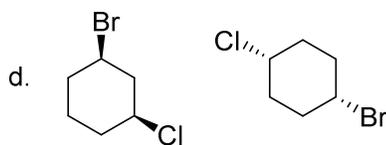
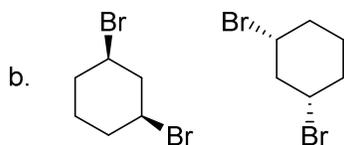
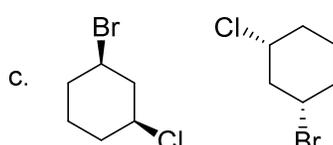
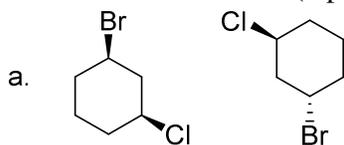
- 4) Show a mechanism for each reaction, and draw a box around the final product. Hint: one of these reactions hasn't been covered in class, but the mechanism is identical to a reaction that we have covered. (30 pts - 10 pts each)



5) Give complete IUPAC names for the following compounds, including E/Z and R/S descriptors where necessary. (15 pts – 3 pts each)



6) For each of the following pairs of molecules, are they identical, enantiomers, diastereomers, or constitutional isomers? (8 pts - 2 pts each)



7) Extra credit! When the molecule below reacts with I_2 in DCM, it forms a cyclic product. Show the structure of this product – the mechanism will not be graded. (6 pts extra credit)

