Introduction: Okay. Here’s the new deal. This problem set is to be handed in and I will grade it (although it is not yet clear how I will factor this into your grade, if at all.) So that this can happen, and you can get some feedback, the exam will be moved to Thursday, 5-October. Same basic idea, though: 2 contiguous hours from when you pick it up from me, which can be anytime after class. You’re on your honor not to violate this time-constraint.

1) Which of the following molecules, drawn using the Newman projection formulas, is/are chiral? Label all stereogenic centers as (R) or (S).

2) Draw all possible steroisomers for the following molecule.

3) How many stereoisomers of the following compound are possible?
4) A 5.0 g sample of optically pure (+)-2-bromooctane was dissolved in 40 mL of CCl₄. The observed rotation was +2.7°, measured in a 10-cm polarimeter tube.
   a) Calculate the specific rotation, \([\alpha]_D\) of (+)-2-bromooctane
   b) Based on the result of the measurement, is it possible to determine whether an (R) or an (S) enantiomer was present? Explain.

5) The following two compounds served as starting materials for the construction of the carbon skeleton of the natural product phorbol, which has tumor-promoting properties.

a) "What is the relationship of the two (diastereomers, enantiomers, identical, or constitutional isomers)?
   b) If the two are mixed and the mixture is subjected to \(^{13}\)C-NMR analysis, how many signals would we expect to see in the spectrum?"