MATH 110   Homework 4

For the puzzles below, please give both your answer and your reasoning. In fact, for the rest of the semester, always provide a justification. Just an answer is not sufficient.

1. Tweedledee and Tweedledum look alike. Tweedledee always lies on Mondays, Tuesdays, and Wednesdays, and always says the truth on the other days. Tweedledum always lies on Thursdays, Fridays, and Saturdays, and always says the truth on the other days. Suppose you meet them and they make the following statements A and B. Determine who said what and which day of the week it is.
   A: I will lie tomorrow.
   B: I lied yesterday and I will lie tomorrow.

2. Here's a well-known puzzle. It's a tricky one, so we'll give two simplier versions also, that will help you solve this puzzle. However, even if you solve this one right away, please still read the other two versions. For you homework, please give solutions to all three versions.

   Alice wrote two consecutive natural (positive integer, such as 7 and 8) numbers on two pieces of paper, and gave one to Bob and one to Crystal. They don't know who got the smaller number and who got the larger number. Then we hear the following dialog between them.
   Bob says: "I don't know the numbers."
   Crystal replies: "I don't know the numbers either."
   Bob says: "I still don't know the numbers."
   Crystal exclaims: "Now I know the numbers!"
   What are the numbers?

   If you are not sure how to determine the numbers in the puzzle above, consider the following, shorter, versions first.

   Version 1. Alice wrote two consecutive natural (positive integer) numbers on two pieces of paper, and gave one to Bob and one to Crystal, just as in the original version, but Bob says right away: "I know the numbers." What are the numbers?

   Version 2. The dialog is as follows:
   Bob says: "I don't know the numbers."
   Crystal replies: "Now I know the numbers!"
   What are the numbers in this case?

   Now, what about the original puzzle?

   Write solutions to each of these three versions.