Decision Theory: Homework # 6

1. Solve exercise 2 of Chapter 9 in Kreps.

2. Solve exercise 4 of Chapter 9 in Kreps.

3. Consider the simpler case of the Savage theorem (9.16 in Kreps) when all acts are simple (i.e., they have a finite range).

   (a) Show that the axioms 9.1-3 and 9.7-10, are *necessary* as well as sufficient for this case.

   (b) Suppose that in the statement of the theorem, we change (b) with the following: For all $a \in A$ such that $p(a) > 0$ there is $b \subseteq a$ such that $0 < p(b) < p(a)$ (a property of p called *non-atomicity*). Are all the axioms still necessary?

   (c) Is axiom 9.9 independent of the others in this special case? Prove your answer. (HINT: It's not.)

   (d) (EXTRA CREDIT) Consider now the general case in which acts can also be non-simple. Suppose that in the statement of the theorem we delete the specification "bounded" from utility. Are the axioms still necessary?