Course: Econ 501, Princeton University
Lecturer: Ariel Rubinstein
Exam: Mid-term, November 2001
Time: 3 hours (no extensions)
Instructions: Answer the three questions. Be short but also as precise as possible.

Problem 1

A consumer has to make his decision *before* he is informed about whether a certain event, which is expected with probability α, happened or not. He assigns the vNM utility $v(x)$ to the consumption of the bundle x in case the event occurs and he assigns the number $w(x)$ to the consumption of x when the event does not occur. The consumer maximizes his expected utility. Both v and w satisfy the standard assumptions about the consumer. Assume also that v and w are concave.

■A) Show that the consumer's preference relation is convex.

■B) Find a connection between the consumer's indirect utility function and the indirect utility functions derived from v and w.

■C) A new commodity appears in the market: "a discrete piece of information which tells the consumer whether the event occurred or not". The commodity can be purchased prior to the consumption decision. Use the indirect utility functions to characterize the demand function for the new commodity.

Problem 2

■A. Define a formal concept for "$\succsim_1$ is close to $\succsim_0$ more than $\succsim_2$ is close to $\succsim_0$ ".

■B. Apply your definition to the class of preference relations represented by $U_1 = tU_2 + (1-t)U_0$ where the function U_i represents $\succsim_i$ $(i = 0, 1, 2)$.

■C. Consider the above definition in the consumer context. Denote by $x_k^i(p,w)$ the demand function of $\succsim_i$ for good k. Is it true that if $\succsim_1$ is close $\succsim_0$ more than $\succsim_2$ is close to $\succsim_0$ than $|x_k^1(p,w) - x_k^0(p,w)| \leq |x_k^2(p,w) - x_k^0(p,w)|$ for any commodity k and for every price vector p and wealth level w?

Problem 3

Consider the following procedure of choice. A decision maker has a strict ordering $\succsim$ over the set X and he assigns to each $x \in X$ a natural number $class(x)$ interpreted as the "class" of x. Given a choice problem A he chooses the element in A which is the best among those elements in A which belong to the "most popular" class in A (that is, the class which appears in A most often). If there is more than one most popular class, he picks the best element from the members of A which belong to a most popular class with the highest class number.

■A) Is the procedure consistent with the "rational man" paradigm?

■B) Can every choice function be "explained" as an outcome of such a procedure?
(Try to formalize a "property" which is satisfied by such procedures of choice and clearly is not satisfied by some other choice functions)