Comments on the Economics 501B Final Exam
University of Arizona
Fall 2017

1. In part (a) there was an inconsistency in the question. I originally wrote the problem to say "each consumer's *preference*," and wrote assumption (a2) that the preference is "convex (*i.e.*, upper-contour sets are convex)." I changed it to a utility function, but forgot to change (a2) to say it's quasiconcave. So (a2) said it was a convex utility function, *i.e.*, its upper-contour sets were convex, a contradiction. Everyone except one student interpreted this the way I meant it — that the utility function is quasiconcave or concave. I graded that one student based on his correct interpretation of the way the question was written — a convex function.

A number of students said incorrectly that the statement in (a) is true — which it would be if the utility functions were all *strictly* increasing (in which case the other two assumptions, (a1) and (a2), would be unnecessary). Partial credit was given for this if the proof was OK.

In part (b) some of you assumed that everyone's lexicographic preference must order the goods the same way, not recognizing that different consumers could order the goods differently. Again, some partial credit was given if the argument you gave in that case was correct.

2. This question was straight out of the lecture notes for both 519 and 501B. See

   `http://www.u.arizona.edu/~mwalker/MathCamp/Solution&ValueFunctions.pdf`

and

   `http://www.u.arizona.edu/~mwalker/05_ParetoEfficiency/UtilityFrontier.pdf`

Also see page 313 of MWG for a presentation of the utility frontier (which, like a lot of people, MWG refer to by its perhaps more common name, the Pareto frontier). For the utility frontier when the utility functions are quasilinear (as in this problem), see pages 325 and 326 of MWG. Unfortunately, they don't relate the Pareto allocations and the utility frontier to the solution and value functions of the maximization problem they consider. (MWG refer to this as partial equilibrium. Most partial equilibrium analysis uses quasilinear utilities, but there's no reason consumers can't have quasilinear utilities in a general equilibrium setting as well.)

It was OK to include $\mathring{x}$ and $\mathring{y}$ as parameters, in addition to u_2; two or three people did this. Of course, when referring to the utility frontier you would have to be considering the value function as only u_2 varies and the other two parameters are held fixed. Also note that you could just as well do everything with $u^2(\cdot)$ as the objective function and u_1 as the parameter.

3. This problem is similar to Exercise #3.8 in the Exercise Book. The solution for that exercise is in the Exercises section of the course website:

   http://www.u.arizona.edu/~mwalker/Exercises/ExerciseSolutions/Solution_3.8.pdf

This problem on the exam went into more detail than #3.8, asking additional questions.

Note my comments in the solution about how things are different (and a little more complicated) for allocations in which either $y_A = 0$ or $y_B = 0$. MWG, in their treatment on pages 325 and 326, neglect this boundary problem: their "unlimited unit-for-unit transfer of utility through transfers of the numeraire" (our y-good) *isn't* unlimited if $y_A = 0$ or $y_B = 0$. I didn't take off any points if you also neglected this issue — as I said in my solution, I also neglected to take this into account when I wrote the problem.

4. This was Exercise #11.2 in Econ 519, and was Problem #5 on the Econ 519 final exam. If you were able to do the proof only for the strictly concave case, I believe I deducted only two points (assuming you did it correctly). Only four people did reasonably well on this problem. I hope this motivates you in the future to go back over exams immediately afterward to figure out what really good answers are (and then to look at solutions if they're provided). Professors don't usually write questions to trick you, but rather to try to reveal how completely you understand something. So it's good to try to get a good, rigorous ex post understanding of the problems on an exam.

5. This problem — both the proof of the proposition, and what the proposition tells you about the relation between the two kinds of equilibrium — are the entire content of the last page of the lecture notes on Arrow's Pricing Formula for Securities:

http://www.u.arizona.edu/~mwalker/08_Uncertainty/ArrowSecurityPricingFormula.pdf

Only a few of you said (correctly) that the proposition actually tells us only that the set of consumption bundles available to a consumer is the same set under each of the two price regimes (if the assumptions of the proposition are satisfied), and that therefore a consumer will choose the same bundle in either case; and since all consumers will do this, the two equilibria coincide. A more common (and inaccurate) answer was something along the lines of "the proposition tells us that the two equilibria are the same."