University of Wisconsin-Madison
Department of Economics

Econ 703 Prof. R. Deneckere
Fall 2002

Homework #12

1. Use the problem of maximizing the Cobb-Douglass utility $U(x,y)= xy$ on the budget set $2x + 2y \leq 8$ to show that one cannot replace the hypothesis of concavity of f in the saddlepoint theorem by the weaker assumption that f is quasiconcave.

2. Sundaram, #25, p. 201.

3. Sundaram, #17, p. 200.

4. Sundaram, #22, p. 201.

5. Let $f : \mathbb{R}^n \times \mathbb{R}^m \to \mathbb{R}$ and $g_i : \mathbb{R}^n \times \mathbb{R}^m \to \mathbb{R}$ for i= 1,..k. Suppose that f(x,a) and each $g_i(x,a)$ are concave in (x,a), where $x \in \mathbb{R}^n$ and $a \in \mathbb{R}^m$. Let $V(a) = \max_{x \in D(a)} f(x,a)$, where $D(a) = \{x \in \mathbb{R}^n : g_i(x,a) \geq 0$ for i= 1,…,k$\}$. Show that V(a) is a concave function of a.