Math 486: Game Theory
Assignment 6
Due Fri 12 Oct

- p.122 #1,7,8
- p.131 #2
- *(Constant functions are continuous)*Let $f : \mathbf{R}^n \to R$ be the constant function $f(a_1, \ldots, a_n) = c$ where c is a fixed constant. Show that f is a continuous function on $\mathbf{R}^n$.
- *(The sum of continuous functions is continuous)* Let $f : \mathbf{R}^n \to R$ and $g : \mathbf{R}^n \to R$ be continuous functions on $\mathbf{R}^n$. Show that $f + g$ is continuous on $\mathbf{R}^n$.
- *(The composition of continuous functions is continuous)* Let $f : \mathbf{R}^n \to \mathbf{R}^m$ be continuous on $\mathbf{R}^n$ and let $g : \mathbf{R}^m \to \mathbf{R}^k$ be continuous on $\mathbf{R}^m$. Show that $g \circ f$ is continuous, where $(g \circ f)(\vec{x}) = g(f(\vec{x}))$ for all $\vec{x} \in \mathbf{R}^n$ defines the function $g \circ f$. *Hint: This one is very quick. Don't use ϵ's.*
- Recall that if $f : X \to Y$ is a function, then it induces a correspondence $R_f : X \to Y$ defined by $R_f(x) = \{f(x)\}$. Show that f is a continuous function on X if and only if R_f is a continuous correspondence on X.