

Assignment #5 for **Mathematics for Economists**
Economics 392M.8, Fall 2013

Due date: Mon. Oct. 7.

Readings: Chapters 4.6 and 4.7

Problems

- A. **From Chapter 4.6:** 4.6.3.
- B. **From Chapter 4.7:** 4.7.3.
- C. **From Chapter 4.7:** 4.7.6.
- D. **From Chapter 4.7:** 4.7.11.
- E. **From Chapter 4.7:** 4.7.14.
- F. We measure distance between bounded functions $f, g : [0, 1] \rightarrow \mathbb{R}$ by $d(f, g) = \sup_{t \in [0, 1]} |f(t) - g(t)|$.
 - 1. Show that the class of function $\{t^n : n \in \mathbb{N}\}$ is not compact.
 - 2. Show that the class of functions $\{\min\{0, 1 - \frac{1}{n}|\frac{1}{2} - t|\} : n \in \mathbb{N}\}$ is not compact.
 - 3. Show that the class of functions with $-1 \leq f(t) \leq +1$ is not compact.
 - 4. Show that the class of functions $\{\frac{1}{n} \min\{0, 1 - \frac{1}{n}|x_n - t|\} : n \in \mathbb{N}\}$ is compact for any sequence x_n in $[0, 1]$.