Math 132 — HW II — due Tue Sep 12.

**Chapter 6.** ( 1, 2, 4, 5, R6, 10abc )

The symbol "R" means read the statement of the problem, and imagine how you would do it if you were asked, but you do not have to write out the solution.

Do also:

**I.)** Let $f$ be continuous on $[a, b]$, and suppose that for all $g \in \mathcal{R}$,

$$\int_a^b f(x)g(x)dx = 0.$$

Prove that $f(x) = 0$ for all $x \in [a, b]$.

**II.)** Let $f, g \in \mathcal{R}$. (Recall $\mathcal{R}$ means Riemann-integrable.)
(a) Show that the function $T_1(x) = \min\{f(x), g(x)\}$ is $\in \mathcal{R}$.
[Hint: $\min\{f(x), g(x)\} = \frac{1}{2}(f + g) - \frac{1}{2}|f - g|$.]
(b) Show also $T_2(x) = \max\{f(x), g(x)\} \in \mathcal{R}$.