Math 132 — HW 2.

Chapter 6. (1, 2, 4, 5, R6)

The letter R before a homework problem number (as in R6 above) 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 \( x \in [a, b] \).

(Recall \( \mathcal{R} \) means the class of Riemann-integrable functions.)

II.) Let \( f, g \in \mathcal{R} \).

(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 \( T_2(x) = \max\{f(x), g(x)\} \in \mathcal{R} \).