MAT 141
Problem Set #6

due in recitation on October 14 or 15, 2004

1. Apostol, section 1.15 # 1, 4, 5, 11, 13, 15
2. Give an example of two step functions, $f(x)$ and $g(x)$, that are defined on the same interval, $[a, b]$, but for which
$$\int_a^b (f \cdot g)(x)\, dx \neq \left(\int_a^b f(x)\, dx \right) \left(\int_a^b g(x)\, dx \right)$$
3. Prove that for any positive integer, p, the function $f(x) = x^p$ is piecewise monotone. (See example 1 on page 77 of the text.)