Assignment #7

(*All Problems Due* **Friday 11/2/01**.)

Section 4.3, # 3.

Section 4.3, # 5.

Section 4.3, # 6.

Section 4.3, # 7.

Section 4.3, # 8.

Section 4.4, # 10.

Additional XI. Suppose $f : [a, b] \to \mathbf{R}$. We define the *lower envelope g* of f to be the function defined by

$$g(y) = \sup_{\delta > 0} \inf_{|x-y| < \delta} f(x),$$

and the *upper envelope h* by

$$h(y) = \inf_{\delta > 0} \sup_{|x-y| < \delta} f(x).$$

Show $g(x) \leq f(x) \leq h(x)$ for all x. Show that f is continuous at x if and only if $g(x) = h(x)$.
    [Compare to 2.51 on page 52.]