Math 220–Homework #9

due at the beginning of class Wednesday, April 6, 2005

I. D'Angelo and West, p. 290, #14.43

II. D'Angelo and West, p. 291, #14.47

III. D'Angelo and West, p. 304, #15.4

IV. D'Angelo and West, p. 305, #15.8

V. D'Angelo and West, p. 305, #15.14

VI. Let f and g be continuous functions on the interval $[a, b]$. Suppose we know that $f(a) = g(a)/2$ and $f(b) = 2g(b)$. Give an example to show that there does not necessarily exist a number $c \in [a, b]$ such that $f(c) = g(c)$. Then prove that under the additional assumption that $g(x) > 0$ for all $x \in [a, b]$, there must indeed exist a $c \in [a, b]$ such that $f(c) = g(c)$.

VII. D'Angelo and West, p. 306, #15.32