Math 477 - HW #8 - due March 31, 2009

#1 Let X and Y be independent random variables each uniformly distributed on $(0, 1)$. Find

  (a) $P(|X - Y| \leq \frac{1}{2})$,
  (b) $P(|\frac{X}{Y} - 1| \leq \frac{1}{2})$,
  (c) $P(Y \geq X | Y \geq \frac{1}{2})$.

#2 Let X and Y have a joint density f that is uniform over the interior of the triangle with vertices at $(0, 0), (2, 0)$, and $(1, 2)$. Find $P(X \leq 1, Y \leq 1)$.

#3 Let $f(x, y) = c(y - x)^\alpha, 0 \leq x < y \leq 1$, and $f(x, y) = 0$ elsewhere.
  (a) For what values of α can c be chosen to make f a density function?
  (b) How should c be chosen (when possible) to make f a density.
  (c) Find the marginal densities of f.

Also, from the text, Chapter 6: #P6, #P9.