Homework 2, Sta 531 Fall 2008

Due Sept. 8

1. Suppose $S = R^1 = \{x | -\infty < x < \infty\}$ and $\mathcal{B}$ the Borel σ-algebra.

   For the following sequence of events, A_i, identify the event $\bigcap_{k=3}^{\infty} \bigcup_{i>k} A_i$

   (a) $A_i = [i, i+2); i = 1, 2, \cdots$.

   (b) $A_i = (0, 1 - 1/i), i = 1, 2, \cdots$.

   (c) $A_i = (0, 1 + 1/i), i = 1, 2, \cdots$.

   (d) $A_i = [i, \infty), i = 1, 2, \cdots$.

   (e) $A_i = (-\infty, a_i)$ with $a_i = sin(i + 0.01)$ for even i; and $a_i = 5 - 1/(i+3)$ for odd i.

   (f) $A_1 = [0, 1]$;

   $A_2 = [0, 1/2), A_3 = [1/2, 1]$;

   $A_4 = [0, 1/3), A_5 = [1/3, 2/3), A_6 = [2/3, 1]$;

   $A_7 = [0, 1/4), A_8 = [1/4, 2/4), A_9 = [2/4, 3/4), A_{10} = [3/4, 1]$;

   $A_{11} = [0, 1/5), \cdots, A_{15} = [4/5, 1]$;

   $\cdots \cdots$.