EE 464
Homework 1
Due Monday Jan. 27, 2003

Problem 1. Leon-Garcia Ch.2 problem 1.

Problem 2. Leon-Garcia Ch.2 problem 2.

Problem 3. Leon-Garcia Ch.2 problem 6.

Problem 4. Leon-Garcia Ch.2 problem 7.

Problem 5. Leon-Garcia Ch.2 problem 11.

Problem 6. Two dice are tossed and the absolute value of the difference between the number of dots showing on each die is noted.

   a. Find the sample space for this experiment.

   b. Find the set A corresponding to the event "the absolute value of the difference between the number of dots showing is even."

Problem 7. Let A and B be events from some sample space. Find an expression for the event "A or B occurs but not both (exclusive OR)" and draw a Venn diagram for this event.

Problem 8. If $\mathbf{X} = \{1, 2, 3, 4\}$ find the smallest algebra (or field) that contains the sets $\{1\}$ and $\{2, 3\}$.

Problem 9. Let $a = (x_1,\ y_1)$, $b = (x_2,\ y_2)$ be points in $\mathbf{R}^2$. Show that

$$d(a, b) = \sqrt{(x_1 - x_2)^2 + (y_1 - y_2)^2}$$

is a metric in $\mathbf{R}^2$.

Problem 10. Let $a = (x_1,\ y_1)$, $b = (x_2,\ y_2)$ be points in $\mathbf{R}^2$. Show that

$$d(a, b) = |x_1 - x_2| + |y_1 - y_2|$$

is a metric in $\mathbf{R}^2$.