

Homework 2
Ma 623 Stochastic Processes
due Tuesday Feb 7 2006

From Ross “Stochastic Processes” 2nd ed. do the following:
page 47 exercise 1.8
page 89 exercises 2.4, 2.10, 2.11, 2.12.

In addition do the following problem:

- (1) Using a software package simulate a Poisson process with rate 2 events/min. Using your simulation estimate the probabilities:

$$\mathbf{P}\{N_{[2,4]} = 4\}$$

$$\mathbf{P}\{S_3 \in [3, 5]\},$$

where $N_{[2,4]}$ denotes the number of events in the time interval $[2, 4]$ minutes, and S_3 is the time of the third event.

Calculate what these theoretical probabilities should be and see what was the difference between your simulated probabilities and the theoretical ones for 1,000, 10,000 and 100,000 repetitions respectively.

(this is called a *Monte-Carlo* simulation approach).