

## MATH 3J04: Home Assignment # 6

**Due to:** December 5, 2000

**Problem 22.7 #8:** If a ticket office can serve at most 4 customers per minute and the average number of customers is 120 per hour, what is the probability that during a given minute customers will have to wait? **Hint:** use the Poisson distribution.

**Problem 22.8 #12:** The breaking strength  $X$  of a plastic block is normally distributed with a mean of 1500 (kg) and a standard deviation of 50 (kg). What is the maximum load such that no more than 5% of the blocks are expected to break?

**Problem 23.3 #4:** Find a 95% confidence interval for the mean  $\mu$  of a normal population with standard deviation 1.2, using the sample 10, 10, 8, 12, 10, 11, 10, 11.

**Problem 23.3 #10:** Assuming the sample is normally distributed, find a 99% confidence interval for the mean  $\mu$  of the melting point of aluminum. The sample values of the melting point are 658, 665, 652, 661, 660.

**Problem 23.4 #12:** If a standard medication cures about 75% of patients with a certain disease and a new medication cures 310 of the first 400 patients on whom it was tried, can we conclude that the new medication is better? Motivate the conclusion by admitting a 5% probability of the error.

**Problem 23.4 #14:** Suppose that in operating battery-powered electrical equipment, it is less expensive to replace all batteries at fixed intervals than to replace each battery individually when it breaks down, provided the standard deviation of the lifetime is less than 5 hours. Set up and apply a suitable test, using a sample of 28 values of lifetimes with standard deviation  $s = 3.5$  hours and assuming normality; admit a 5% probability of the error.