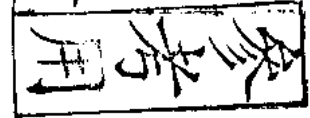1. At 6:00 am, You are hitching on a highway arriving Westland. (30%) Suppose that during the early morning, the number of car going West can be thought to follow, approximately, a Poisson distribution at a rate of 4 cars per hour. The first car doesn't stop. (a). What is the probability that you will have to wait at least another 30 minutes before the next car comes? (b). Suppose you believe there is a 80% chance that any given car gives you a ride, how long do you expect to wait?

2. The expected lifetime of fuses produced by a given factory is (20%) 300 hours. Assume that the distribution is exponential. The electric system of your car needs one of these fuses in order to work. (a). Find the distribution of the number of fuses that will fail during during a 100 hours drive (assume you start with a new fuse). (b). If you go on a long trip and have only 4 spare fuses, how long do you expect to be able to drive?

3. On a line of the subway system during the rush hour, trains run approxi-(20%) mately every 5 minutes. You arrive at a station and have no information about how long ago the last train did pass through. (a). What is the probability that you will have to wait for less than 2 minutes? (b). How long do you expect to wait?

4. Mr. A lives in TAIPEI CITY and takes the subway to go to work. His train (30%) can arrive at any time between 7:49 and 7:54, and it can take equally well between 12 and 15 minutes; then Mr. A has a 3 minutes walk to his office. If he arrives after 8:05, he will be fined at a rate of 50 NT$ per minute. Determine:

(a). The distribution of the time of arrival.

(b). The probability that he arrives after 8:05.

(c). The distribution of the fine that he may have to pay.