

Assignment 6

1. A lawyer commutes daily from his suburban home to his midtown office. The average time for a one-way trip is 24 minutes, with a standard deviation of 3.8 minutes. Assume the distribution of trip times to be normally distributed.
 - (a) What is the probability that a trip will take at least 1/2 hour?
 - (b) If the office opens at 9:00 A.M. and he leaves his house at 8:45 A.M. daily, what percentage of the time is he late for work?
 - (c) If he leaves the house at 8:35 A.M. and coffee is served at the office from 8:50 A.M. until 9:00 A.M., what is the probability that he misses coffee?
 - (d) Find the length of time above which we find the slowest 15% of the trips.
 - (e) Find the probability that 2 of the next 3 trips will take at least 1/2 hour.
2. The IQs of 600 applicants of a certain college are approximately normally distributed with a mean of 115 and a standard deviation of 12. If the college requires an IQ of at least 95, how many of these students will be rejected on this basis regardless of their other qualifications?
3. Statistics released by the National Highway Traffic Safety Administration and the National Safety Council show that on an average weekend night, 1 out of every 10 drivers on the road is drunk. If 400 drivers are randomly checked next Saturday night, what is the probability that the number of drunk drivers will be
 - (a) less than 32?
 - (b) more than 49?
 - (c) at least 35 but less than 47?
4. The length of time for one individual to be served at a cafeteria is a random variable having an exponential distribution with a mean of 4 minutes. What is the probability that a person is served in less than 3 minutes on at least 4 of the next 6 days?
5. The life in years of a certain type of electrical switch has an exponential distribution with an average life of $\beta=2$. If 100 of these switches are installed in different systems, what is the probability that at most 30 fail during the first year?
6. The life of a certain type of device has an advertised failure rate of 0.01 per hour. The failure rate is constant and the exponential distribution applies.
 - (a) What is the mean time of failure?
 - (b) What is the probability that 200 hours will pass before a failure is observed?

Due Date: 22.12.2011