workers are subject to work-related injuries. One disorder, caused by strains to the

hands and wrists, is called carpal tunnel syndrome. It strikes as many as 23,000 workers per

year. The U.S. Labor Department estimates that the average cost of this disorder to

employers and insurers is approximately $30,000 per injured worker. Suppose these costs

are normally distributed, with a standard deviation of $9,000.

a. What proportion of the costs are between $15,000 and $45,000?

b. What proportion of the costs are greater than $50,000?

c. What proportion of the costs are between $5,000 and $20,000?

d. Suppose the standard deviation is unknown, but 90.82% of the costs are more than

$7,000. What would be the value of the standard deviation?

e. Suppose the mean value is unknown, but the standard deviation is still $9,000. How much

would the average cost be if 79.95% of the costs were less than $33,000?

2

The average length of time between arrivals at a turnpike tollbooth is 23 seconds. Assume

that the time between arrivals at the tollbooth is exponentially distributed.

a. What is the probability that a minute or more will elapse between arrivals?

b. If a car has just passed through the tollbooth, what is the probability that no car will show

up for at least 3 minutes?

During the summer at a small private airport in western Nebraska, the unscheduled arrival

of airplanes is Poisson distributed with an average arrival rate of 1.12 planes per hour.

a. What is the average interarrival time between planes?

b. What is the probability that at least 2 hours will elapse between plane arrivals?

c. What is the probability of two planes arriving less than 10 minutes apart?

Suppose that during any hour in a large department store, the average

number of shoppers is 448, with a standard deviation of 21 shoppers. What is the probability that

a random sample of 49 different shopping hours will yield a sample mean between 441 and 446

shoppers?

a. A population is normally distributed, with a mean of 23.45 and a standard deviation of

3.8. What is the probability of each of the following?

b. Taking a sample of size 10 and obtaining a sample mean of 22 or more

c. Taking a sample of size 4 and getting a sample mean of more than 26