

Homework #1
Supply Chain Models: Manufacturing & Warehousing (ISyE 3104) – Spring 2002
Due January 17, 2002

Show all your steps to get partial or full credit. Total 40 points.

Reading assignment: Read Chapter 1.

Question 1

Annual demand for a particular brand of running shoes in a department store is normally distributed with mean $\mu=800$ and standard deviation $\sigma=200$.

- (a) What is the mean and standard deviation of weekly demand?
- (b) What is the mean and standard deviation of monthly demand?

Question 2

Bagel Co. sells five different types of bagels every day. Daily demand for each type of bagel is normally distributed with mean and standard deviation given in the table below.

Bagel type	1	2	3	4	5
Mean	200	250	500	600	300
Std. dev.	40	50	100	200	80

What is the distribution (and its parameters) for the total monthly demand for bagels in the store? (Assume 30 days per month.)

Question 3

Consider the following optimization problem where a_j and b_j are positive constants and x is a nonnegative variable.

$$\text{Min } f(x) = \sum_{j=1}^n [a_j / x + b_j x / 2]$$

- (a) Is $f(x)$ convex or concave?
- (b) Find the value of x that minimizes $f(x)$.

Question 4

Solve Problem 5.5 on page 249.

Question 5

Seasonal demand for handbags in an online store is distributed normally with mean 150 and standard deviation 20.

- (a) What is the probability that the demand for handbags in a given season does not exceed 200?
 - (b) What is the probability that the demand for handbags in a given season is at least 50?
- Use Table A-4 in the back of the book.