Homework #9
Supply Chain Models: Manufacturing & Warehousing (ISyE 3104) – Spring 2002
Due Wednesday March 20, 2002, 2:30pm
You may bring the homework to the instructor’s office (or mailbox), or give it to the TA during office hours.

Show all your steps to get partial or full credit. Total 25 points.

Question 1

Jeremy, the office manager of The Technique, stocks replacement toner cartridges for laser printers. Demand for cartridges is approximately 30 per year and is quite variable (which can be represented using the normal distribution with a standard deviation of 6). Cartridges cost $100 each and require 1 month to obtain from the vendor. Placing an order costs $40. Shortages cost an estimated $25 per unit. Holding cost is calculated with an annual interest rate of 12%.

a) (15 points) Jeremy uses a (Q,R) policy to control stock levels. Find the parameters of the optimal policy.

Answer all the following questions based on your answer to part (a).

b) (2 points) Determine the safety stock level.

c) (2 points) Find the average annual holding, setup and penalty costs.

d) (2 points) What is the average time between placements of orders?

e) (2 points) Find the proportion of order cycles in which no stock-outs occur.

f) (2 points) Find the proportion of demand that is unmet.