Show all your steps to get credit.

**Reading assignment**: Read Chapter 5.

1. (10 points) A distributor sells 30,000 pairs of men’s shoes annually. It costs the distributor $150 to place and order and each pair of shoes incurs a holding cost of $0.75 per month. If there is not enough stock to satisfy the demand at any time, excess demand is backordered and a backorder cost of $2 per month is incurred per pair of shoes. Determine the optimal economic order quantity, the optimal backorder quantity, the number of orders per month, the length of the order cycle, and the total annual cost.

2. (5 points) A newsboy keeps careful records of the number of papers he sells each day and the various costs that are relevant to his decision regarding the optimal number of newspapers to purchase. For what reason might his results be inaccurate? What would he need to do in order to accurately measure the daily demand for newspapers?

3. The buyer for Handheld Heaven must decide on the quantity of a high-priced woman’s handbag to procure in Italy for the following Christmas Season. The unit cost of the handbag to the store is $28.50 and the handbag will sell for $150. A discount firm purchases any handbags not sold by the end of the season for $20. In addition, the store accountants estimate that there is cost of $0.40 for each dollar tied up in inventory at the end of the season (after all sales have been made).

   a) (3 points) What type of inventory model would be appropriate in this environment? Why?
   b) (8 points) Suppose that the sales of the bags are equally likely to be anywhere from 50 to 250 handbags during the season. Based on this, how many bags should the buyer purchase? (solve this problem assuming a continuous distribution).
   c) (7 points) A detailed analysis of past data shows that the number of bags sold is better described by a normal distribution, with mean 150 and standard deviation of 20. Now what is the optimal number of bags to be purchased?
   d) (2 points) The expected demand was the same in parts (b) and (c), but the optimal order quantities should have been different. What accounted for this difference?