# Question 6: 15 points

The biggest inventory problem at the Barko facility is the storage of boom sections for their various Knuckleboom models. There are two types of boom sections: short and long. The following table outlines the demand in the next 5 months and the projected purchase price for each type of boom section.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Demand** | **May** | **June** | **July** | **August** | **September** |
| Short booms | **35** | **30** | **20** | **29** | **16** |
| Long booms | **37** | **11** | **16** | **33** | **10** |
| **Storage capacity** | 50 | 46 | 46 | 42 | 42 |
| **Purchase price** |  |  |  |  |  |
| Short booms | $850 | $800 | $900 | $950 | $900 |
| Long booms | $1,050 | $1,100 | $1,200 | $1,200 | $1,150 |

Due to the current storage rack system, each type of boom consumes the same amount of storage capacity and they can store up to 35. The carrying cost is 2.5% of the purchase price for that month. Currently there are 15 short booms and 18 long booms on hand. They can order up to 40 of each type each month. Create an Excel model to determine the optimum ordering strategy.

**Question 7: 10 points**

Pettibone currently has 3 people answering phones in their customer call center. The firm has been receiving complaints that customers have been waiting too long before speaking to a real person. Based on phone system data the following table describes the calls received per hour during certain times of the day.

|  |  |  |
| --- | --- | --- |
|  |  | Average calls per hour |
| 8:00 AM | 11:00 AM | 34 |
| 11:00 AM | 12:00 AM | 41 |
| 12:00 AM | 2:00 PM | 33 |
| 2:00 PM | 5:00 PM | 27 |

Currently calls take an average of 5 minutes to handle each call. Actual service times are exponentially distributed and arrivals rates follow a Poisson distribution. Management wants customers to wait no longer than 3 minutes, on average, before they speak to a real person. Analyze the possible system improvements listed below (they can be combined) and make a single recommendation to management. Include the recommendation and data backing up this recommendation as a summary sheet in your Excel spreadsheet, not an additional excel file.

1. Automated phone system reduces arrivals by 20% - cost $2 million
2. Additional operators at a cost of $55,000 per year
3. Installation of additional software tools (decrease service time by 1 minute) – cost $1.5 million