**Homework #2 Due February 18**

Seven ships on the average arrive at the port each day (24 hours) that can handle one ship at a time. It takes, on the average three hours to unload and load a ship before the next ship can start service. Assume Poisson arrival and exponential service time.

1. How many hours, on the average, does a ship wait in line for service?

2. How many hours, on the average, does it take from the moment a ship approaches the port until the ship is back to sea?

3. How many ships, on the average, wait in line?

Management considers building a second dock to ease congestion at the port.

4. How many hours, on the average, does a ship wait in line for service?

5. How many hours, on the average, does it take from the moment a ship approaches the port until the ship is back to sea?

6. How many ships, on the average, wait in line?

7. Management will get a loan for building the second dock for a daily cost of $50,000 so two ships can be serviced simultaneously. A ship waiting in line costs the port authority $400 per hour. How much money will be saved or lost by the port authority by building a second dock?

Now suppose that there are only three slots for ships to wait in line and if a fourth ship arrives it is turned away to another port.

8. How many hours, on the average, does a ship wait in line for service?

9. How many hours, on the average, does it take from the moment a ship approaches the port until the ship is back to sea?

10. How many ships, on the average, wait in line?

11. How many ships are turned away in one year (365 days)?