EECS 863
Homework 2

1. Consider a Continuous Time Markov chain with state space S = {1, 2, 3} and with instantaneous transition rates of:

$q_{21} = .5$
$q_{31} = 0$
$q_{12} = 1.2$
$q_{32} = 0$
$q_{13} = .6$
$q_{23} = .2$

Find π_j j = 1, 2, 3.

2. Repeat problem 1 with $q_{31} = .5$.

3. Consider a Continuous Time Markov chain with state space S = {1, 2, 3} as shown below.
a. Find π_j j = 1, 2, 3.
b. Mapping States into number of customers in the system as follows,
State 1=Empty
State 2=One customer in the system
State 3= Two customers in the system
Find the average number of customers in the system.
c. Find the probability the system is full.