Cars arrive at a gas station at an exponentially distributed rate $\lambda$. The gas station has 3 pumps, each of which can service a car at an (exponential) rate $\mu$. Assume that arriving cars go to a competing gas station if all three pumps are occupied.

1. (2 points) Start formulating the problem by naming 4 states for the system.

2. (4 points) We are interested in the long-term probabilities for this system. Set up the system of equations for $P_0$, $P_1$, $P_2$, and $P_3$.

3. (4 points) What percentage of arriving cars are lost to the competing gas station?