BIOC 455/555
Fall 2016
Homework # 8
Due at the beginning of class on Tuesday, November 1st.

In class we derived the stationary probability distribution of the number of particles undergoing a birth-death process with constant production and exponential decay. In other words, the birth rate was given by λ and the death rate by $n * \gamma$. Now consider instead a birth-death process in which the birth rate is λ and the death rate is simply γ (*i.e.* the death rate does not depend on the number of particles), where λ and γ are both constants and $\lambda < \gamma$. Show that the stationary probability distribution for this simpler case is given by:

$$P_n = \left(1 - \frac{\lambda}{\gamma}\right)\left(\frac{\lambda}{\gamma}\right)^n. \tag{1}$$