Homework 4

Problem 1. A random variable $S$ taking whole numbers values $0, 1, 2, ...$ is said to be a Poisson random variable with parameter $\lambda$ if for some $\lambda > 0$,

$$Pr(S = k) = e^{-\lambda} \frac{\lambda^k}{k!}. \quad (1)$$

a) Show that (1) defines a probability density function by proving

$$\sum_{k=0}^{\infty} Pr(S = k) = 1.$$

b) Compute the expectation and the variance of $S$ in terms of $\lambda$.

Problem 2

Suppose a box A contains 4 red and 5 green chips and box B contains 6 red and 3 green chips. A chip is chosen at random from box A and placed in box B. Finally, a chip is chosen at random from those in box B. What is the probability that a green chip was transferred given that a red chip was drawn from box B?