

The University of Winnipeg
Department of Mathematics & Statistics
STAT-4401(3): Assignment 1
Due Date: Monday, January 19, 2015; in class.
Instructor: M. Ghahramani

1. Use the probability generating function for the following:
 - (a) Let $X \sim \text{Poisson}(m)$. Show that $E(X) = \text{Var}(X) = m$.
 - (b) Let $X_1 \sim \text{Poisson}(m_1)$ and $X_2 \sim \text{Poisson}(m_2)$ be independent random variables. Show that $X_1 + X_2 \sim \text{Poisson}(m_1 + m_2)$.
2. Problem 1 on p. 91 of the textbook. Note: $q = 1 - e^{-1}$.
3. A random variable X has p.g.f. $g_X(t) = \sinh(t)/\sinh(1)$. What is the probability distribution of X ? Note: $\sinh(z) = \frac{e^z - e^{-z}}{2}$.
4. #4 p. 92 of the textbook. Hint: Assume the random variable has finite range.
5. #8 p. 92 of the textbook.