Exercise sheet 7

Probability and Statistics, MTH102

1. The expected number of typos in a certain newspaper is 0.3. What is the probability that the newspaper has more than 3 errors?

2. The probability of winning in a particular game is 0.01. Use the Poisson approximation to compute the probability of winning in 5 out of 10000 games.

3. If X is a Poisson random variable with parameter λ, then show the following relations on the moments: $E[X^n] = \lambda E[(X+)^{n-1}]$.

4. If X is a Poisson random variable with parameter λ, then $p(i)$ increases and then decreases. Compute $p(i+1)/p(i)$ and use that to find out for which value of i the $p(i)$ will attain its maximum value.

5. Let X be a *continuous* random variable that cannot take negative values. Show the Markov's inequality, i.e. $P\{X \geq k\} \leq \frac{E[X]}{k}$. Why does the Weak Law of large numbers hold for continious random variables too?