Recitation 10
March 23, 2006

1. Suppose X is uniformly distributed between a and b.

   a) Find the transform of X.

   b) Use the transform in (a) to find the mean and the variance of X.

2. A three sided die is described by the following probabilities:

$$P(X=1)=\frac{1}{2}, P(X=2)=\frac{1}{4}, P(X=3)=\frac{1}{4}.$$

   a) Find the transform of the above random variable.

   b) Use the transform to find the first three moments, $E[X], E[X^2], E[X^3]$.

   c) Check your answers in (b) by computing the moments directly.

3. Suppose a nonnegative discrete random variable has one of the following two expressions as its transform:

   (i) $M_X(s) = e^{2(e^{s-1}-1)}$
   (ii) $M_X(s) = e^{2(e^{s}-1)}$

   (a) Explain why one of the two could not possibly be its transform, and indicate which one is the true transform.
   (b) Find $P(X=0)$.