EEL 6825 HW #1 Spring 2005 J.B. Gao

Due Jan 13, Thur, 2005

1 (optional) (a) prove that the integration of the normal pdf is 1;
(b) do the same for the exponential pdf; also please find the mean and variance for the random variable of exponential pdf.

2. Matlab simulation problem: it's a simple problem with the following steps:
(i) Choose an initial random seed, get, say 1000 uniformly distributed random variables. Denote them by $r_i,\ i = 1, \cdots, n$.
(ii) Get a new sequence $u_i,\ i = 1, \cdots, n$ from $r_i,\ i = 1, \cdots, n$ by using the rule: $u_i = 1$ if $1/2 \leq r_i < 1$, and $u_i = -1$, otherwise.
(iii) Form $y_n = \sum_{i=1}^{n} u_i$.
(iv) Get a large number of y_n by varying the initial random seed; check if the distribution of y_n follows a normal distribution (Hint: it's a normal distribution with mean 0 and variance n).