

**EE 5654 - Digital Communications - Spring 2005**  
**Homework 1**  
**Due Tuesday 1/25/04**

1. Proakis Text 2-7
2. Proakis Text 2-14
3. Proakis Text 2-20
4. Using Matlab generate 10,000 instances of a zero mean Gaussian random variable with variance of 9. Plot the normalized histogram of the data.
5. Using Matlab generate 10,000 instances of a two element Gaussian vector with zero mean and auto-correlation matrix (same as covariance matrix in this case)

$$\Sigma_{XY} = \begin{bmatrix} 9 & 0 \\ 0 & 9 \end{bmatrix}. \text{ Plot the normalized histogram of the random variable}$$

$Z = \sqrt{X^2 + Y^2}$  . What kind of random variable is Z?