Signal Compression (ECE 242) **January 15, 2008**
Gibson **Handout #5**

Homework No. 2

Due: January 22, 2008

1. For the high resolution quantization case, we showed in class that the average distortion is given by

$$D \cong \sum_{i=1}^{N} \frac{P_i}{\Delta_i} \int_{x_{i-1}}^{x_i} (x - y_i)^2 dx$$

Find necessary conditions on the output values to minimize *D.*

2. For an 8-level uniform MMSE quantizer optimized for a Gaussian input pdf, calculate the output entropy.

3. For an 8-level nonuniform MMSE quantizer optimized for a Gaussian input pdf, calculate the output entropy.

4. Plot the rate distortion function for a memoryless Gaussian source subject to the MSE distortion measure.

5. Do Problem 5.1 in the text.