Sheet 2

1. Problem 1.10 in book

Check the solution manual for the answer of number

d) divide by number of levels 1024 not 1023 as mentioned.

1. Quantize and encode the following sampled signal x(n) using 4 quantization levels and minimum number of bits. Compute the average error power in both cases.

X (n) = {-1.22, 1.5, 3.24, 3.94, 2.20, -1.10, -2.26, -1.88, -1.2}.

Ans: delta (3.94-(-2.26)) / 4 = 1.55

The four levels are [[(-2.26), (-0.71)], [(-0.71), 0.84], [0.84, 1.615], [1.615, 3.165]]

The sample values will be assigned the value of the midpoint of their corresponding level

The midpoints of the four levels are [-1.485, 0.065, 1.615, 3.165]

The average power is computed using the formula mentioned in the lecture

For encoding 2 bits are enough with values 00, 01, 10, 11