CS 6817 HW 2

2.38, 2.46, 2.56 (a) and (b)

# 2.38

We use this formula of stability:

The formula for Fourier coefficients of the Tribes function is given in the textbook on page 97:

There are tribes with members each. For each , we write it as , where is the intersection of with the i-th tribe:

Since the we need in the stability formula:

If we define , then the above could be rewritten as

Since when . Notice both instances have in common.

So,

We want to simplify something:

So,

# 2.46

The Mean Value Theorem for a function continuous in the domain interval :

We claim that

So, for some :

Which means we have to show .

We differentiate with respect to :

Because when , the expression inside the summation is anyway.

Now we set and employ knowledge from the previous exercise, 2.45:

Which makes

Now we need to prove

Well, since ,

Thus,

QED.