**Problem 1**

1. According to the note

Therefore

Therefore

,

For k=1,…,d

Therefore



**Inputs**: Data and definitions , and

**Outputs**: Values for

1. initialize in some way
2. For iteration t = 1,…,T

Update q(λ) by setting

,

Update q() by setting

Updating q(α) by setting

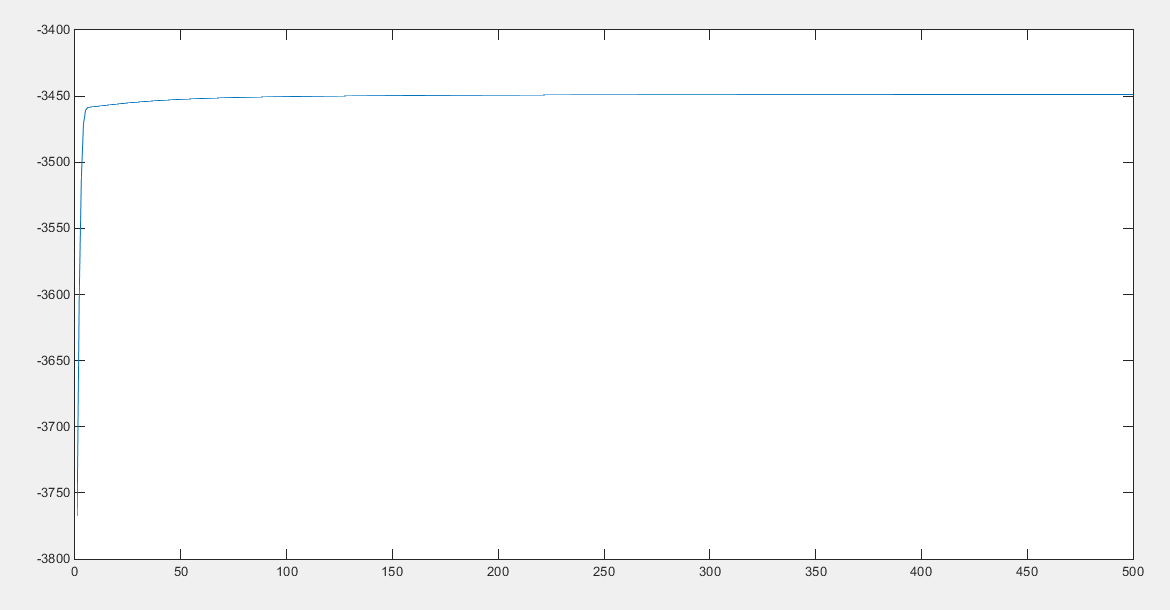
Evaluate L(to access convergence

L(

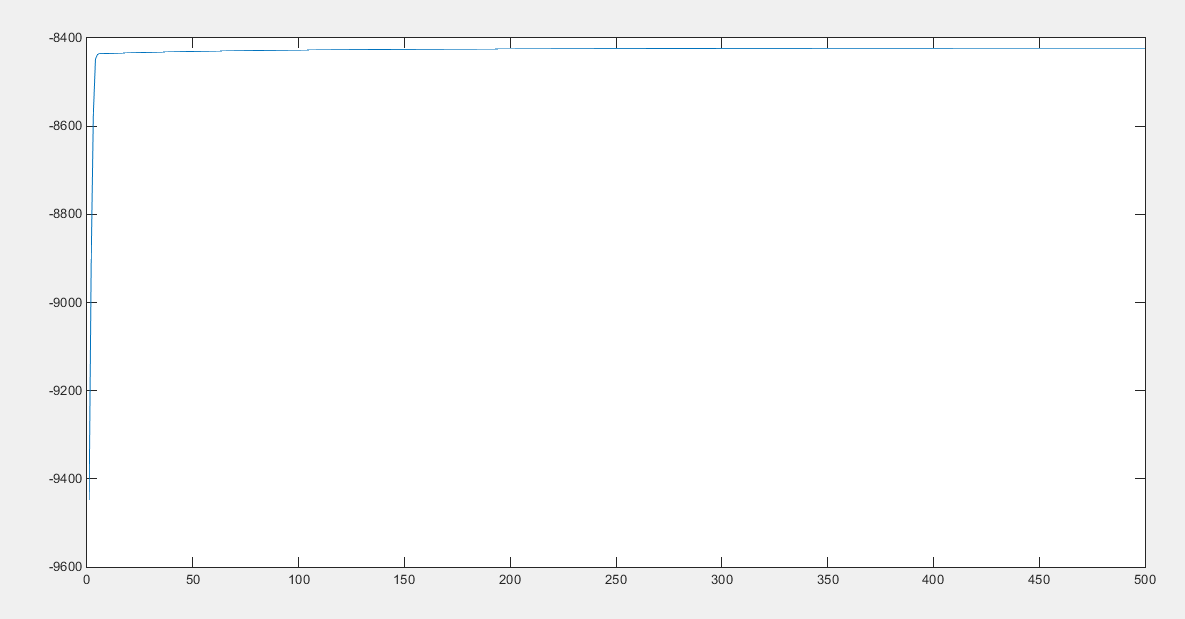
=

**Problem 2**

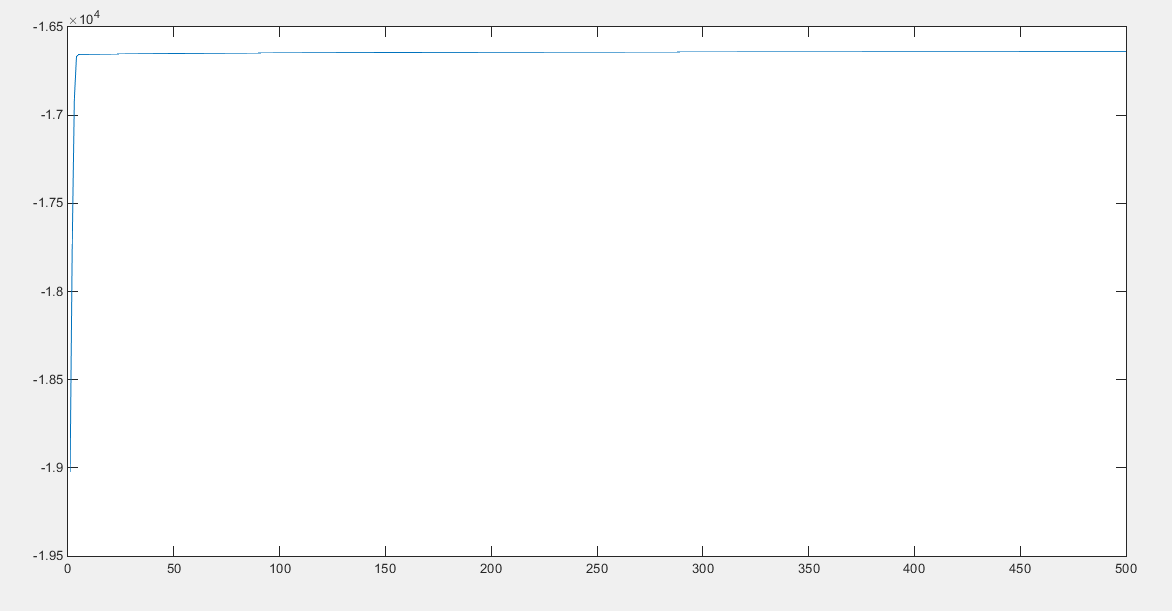
1. For the first dataset



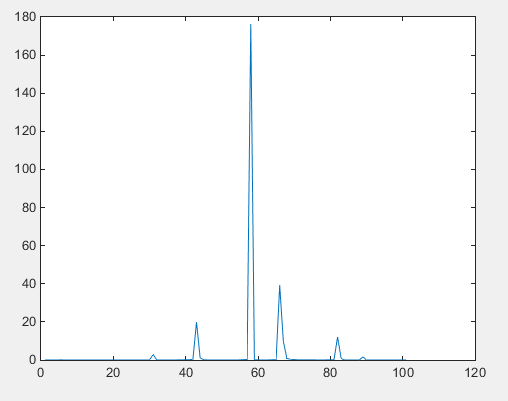
For the second dataset



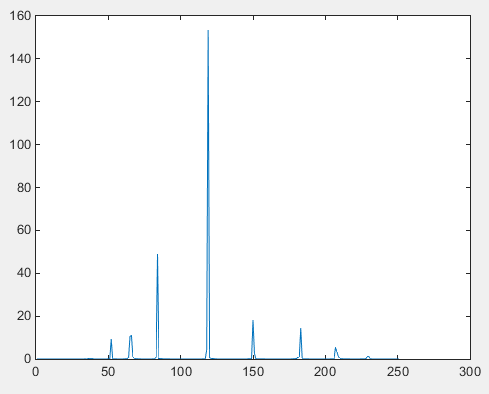
For the third dataset



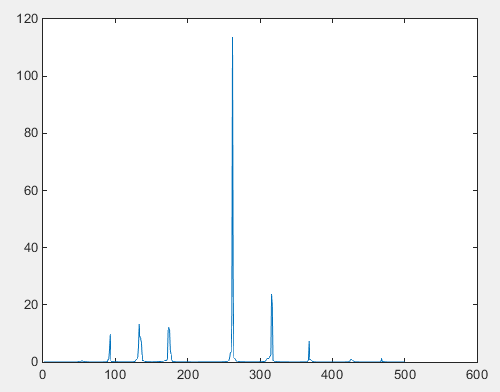
1. For the first dataset



For the second dataset



For the third dataset



1. For the first dataset



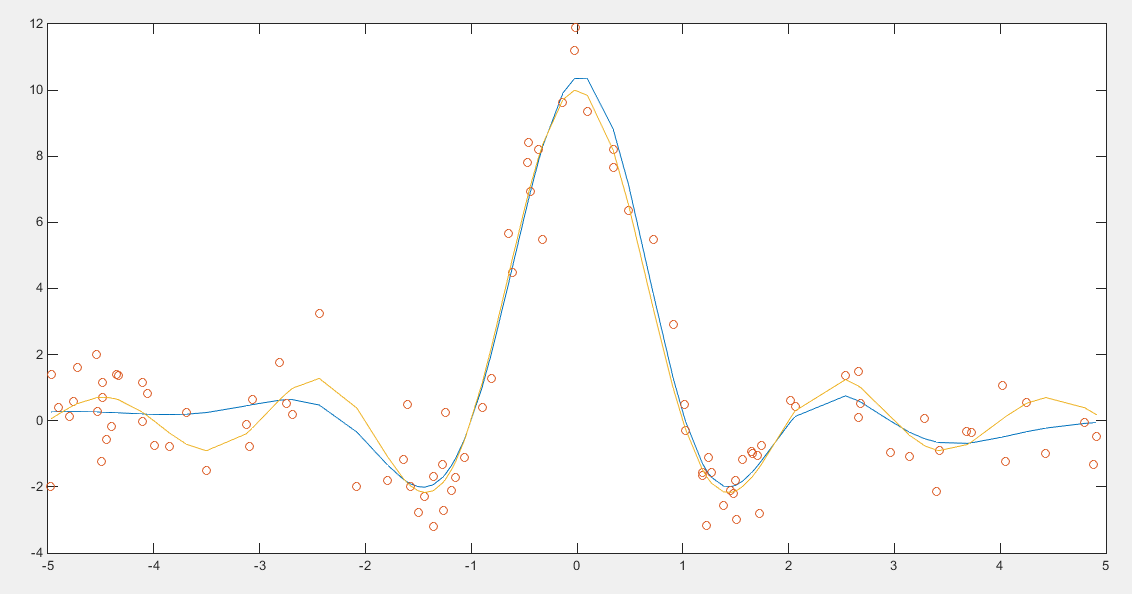
For the second dataset



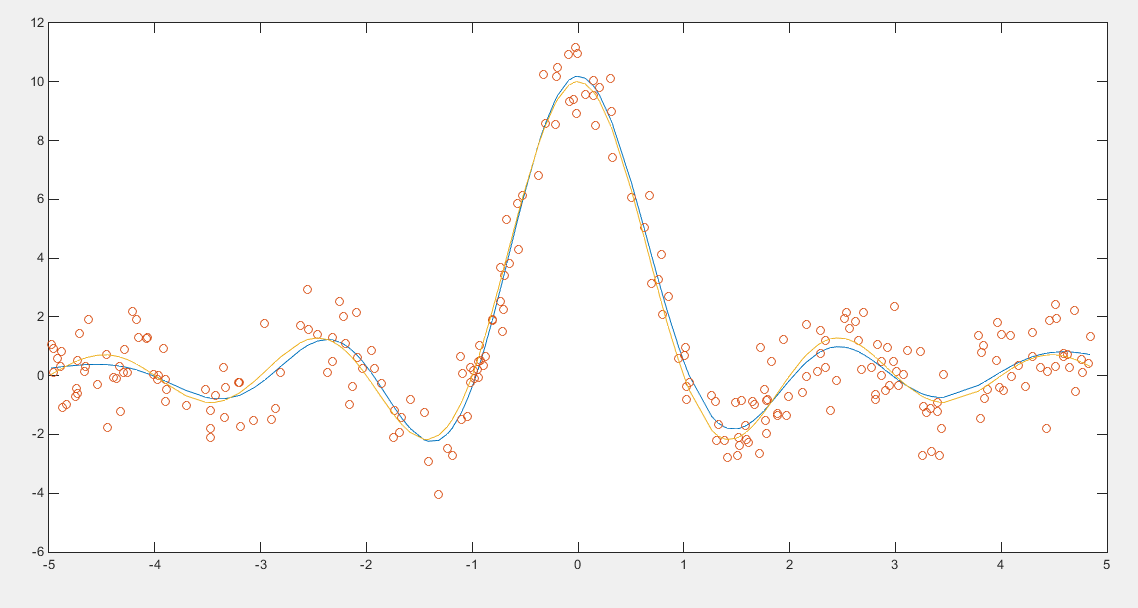
For the third dataset



1. For the first dataset



for the second dataset



for the third dataset

