1.

(a) I talked with Safwan and he helped me to figure out question number 6.

(b) I acknowledge this.

2.

The methodology includes three steps which are:

Write a logic program, called knowledge base, to describe the problem.

Form a query to this knowledge base.

The answer to the query is a solution to the original problem.

3.

We can define a binary tree as follow:

Constant: nil

Function symbol: treeNode(Key, L, R) : L left subtree, R: right subtree

4.

Given f(X,Y,g(a)) = f(g(Y),Z,X)

X = g(Y)

Y = Z

g(a) = X

after replace X with g(Y):

Y = Z

g(a) = g(Y)

from g(a) = g(Y) we can get Y = a, and because Y = Z then Z = a:

X = g(a)

Y = a

Z = a

5.

To define length(L,X) we can write as follow:

Length[L,X] :- L=[X|Tail], length(Tail,Y) ,X = Y + 1.