## Question 1.4

a)

**Base case:** Let n = 0.

Then →

**Induction:** Let suppose that by strong induction for all k <n – 1 its true then we have to prove:

But as its true for all k < n-1 specially for n/2

Then

Thus

For all

b) Let b = [] then the property is false as

And

**Bonus:** Let the property be:

## Question 2.4

The first equation gives us this equality:

The second equation gives us this equality:

Let’s now prove the following equation:

Induction:

Base case:

Step: Let assume for any ‘acc’

We must prove that:

Then

QED