Dominick Girard  
CSCI 3236 Homework #2

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1. Proof

Since base is

We need to show this for i >= 0 to hold true

Isolating the left side we get

And since we know this by induction  
  
  
We then substitute it back in   
  
  
Now we work on the Right Side   
  
  
Using the theorem

Putting it all Together have have

This equation shows that

Using induction, this proves that for any string w and all i >= 0.

**2) ()**

**3)   
  
4) The set of strings over {a, b} that contain the substring aa and the substring bb.**