Section 6

Question 2

Answer 2.

1. Let as assume L is regular, let p be a constant provided by the pumping lemma.

2. Let w be the string 0^3. This string S is in L and is of length at least p. So w can be written as xyz with $|xy| \leq p$ and y not ε

3. Pumping lemma state that. if $xyz \in L$ then $xy^k z$ also is Ly contains at least one 0 in y since y is not ε

4. let us assume for k = 2, the resulting string is xyyz.

5. So it suffices to show that $p3 < p^3 + p < (p+1)^3$ The first in equality holds ~~string~~ since $q > 0$

6. The claim is established, so $xyyz$ is not in L.

7. This contradicts the pumping lemma, so our original assumption, that L was regular is not incorrect

The CFG can be given by

Production rule

(P) :

$S \rightarrow 0S|1S$

$S \rightarrow \varepsilon$

The rules area in the combination of 0's & is with the start with start symbol.