Pumping Lemma

if a langugae L ⊆ Σ* is regular, then there exists a constant n > 0 such that for any string z ∈ L, |z| ≥ n, z can be factorized as z= uvw with the following properties:

i) |uv| ≥ n (loop is in the beginning)
ii) |v|≥ 1 (loop isn't empty)
iii) ∀ i ≥ 0, $uv^iw \in L$

v can be repeated any number of times, and string is still in the language

"if L is regular(p) , then q is true" which implies if q is not true, then L is not regular

5 steps to prove languagae isn't regular given a language L ⊆ Σ*

1.) Pick an arbitrary constant n > 0
2.) choose a string z s.t. z ∈ L
3.) consider a factorization of z=uvw s.t. |uv| ≥ n and |v ≥ 1
4.) find an integer i s.t. z' = $uv^iw \notin L$
5.) conclude that L is not regular

Closure Properties of Regular languages: