Thm (Pumping Lemma)

If $A$ is a regular language, then there is a number $P$ (pumping length) such that for $s \in A$ and $|s| \geq P$, $s$ can be decomposed into $s = xyz$, satisfying the following conditions:

1. for $i \geq 0$, $xy^iz \in A$

2. $|y| > 0$, and

3. $|xy| \leq P$