Pumping Lemma

Given a regular language $L$, there exists a number $p$ such that any string $s \in L$, with $|s| \geq p$, can be divided into three pieces, $s = xyz$ satisfying:

1. $xy^iz \in L$, $\forall i \geq 0$.
2. $|y| > 0$.
3. $|xy| \leq p$.

Proof Blueprint

Claim: The language $L = \langle$some language$\rangle$ is not regular.

Proof: Suppose $L$ is regular. Let $p$ be the number from the pumping lemma.

Consider $s = \langle$TODO: Select $s$ that will work with $s \in L$ and $|s| \geq p$$. Since $s \in L$ and $|s| \geq p$, the conditions of the pumping lemma must hold for $s = xyz$.

<TODO: Find conditions on what $y$ must equal>

Consider the string $s' = xy^iz = \langle$TODO: Select $i$$>$ $\langle$TODO: Show what $s'$ equals$>$

<TODO: Show $s'$ is not in $L$>

$\Rightarrow s' \notin L$, which is a contradiction of the pumping lemma. Therefore, the language is not regular.