1. Let L be a language and a be the symbol in ∑.  
   Let A = L and B = L/a  
     
   Given: L/a = {w | wa ε L}  
     
   Basis: A ∩ B  
   Induction:  
    by DeMorgan’s Law  
   Here we can find the intersection between A and B and dinfe the differences where A ≠ B. By using DeMorgan’s Law we can find all the subsets of B in the language A.   
   Diagram

   Description automatically generated

2.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| A | = |  |  |  |  |  |
| B | X | = |  |  |  |  |
| C | X | X | = |  |  |  |
| D | X | X | X | = |  |  |
| E | X | X | X | = | = |  |
| F | X | = | X | X | X | = |
|  | A | B | C | D | E | F |

Equivalences:  
B=F  
D=E

Diagram

Description automatically generated

3a.  
L = {www | w ε{a,b}\*}  
Claim: Leq is regular.

Let p = P/L constant

By contradiction let Leq be not regular  
  
Text

Description automatically generated with medium confidence

Therefore our claim is invalid this is not a regular language.

3b. L =   
Claim: Let leq be regular

Let p = P/L constant

By contradiction let Leq be not regular

Consider the string w =

w =   
w =   
  
a =

b =   
c =

i = 0

(`ε == not epsilon)

Therefore our claim is invalid, because b will not be 2n bigger than a proving this is not a regular language.