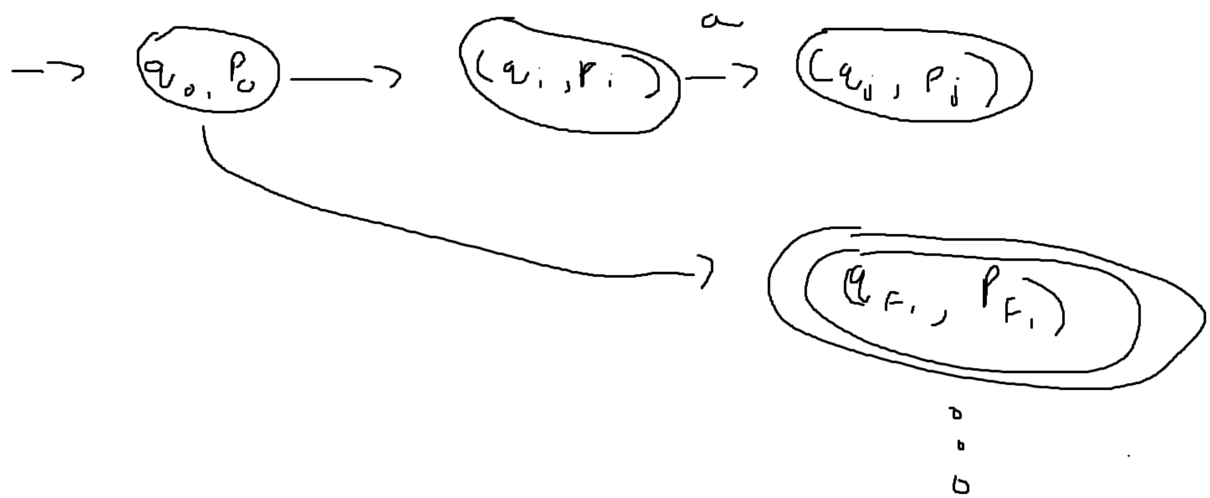
1.

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}

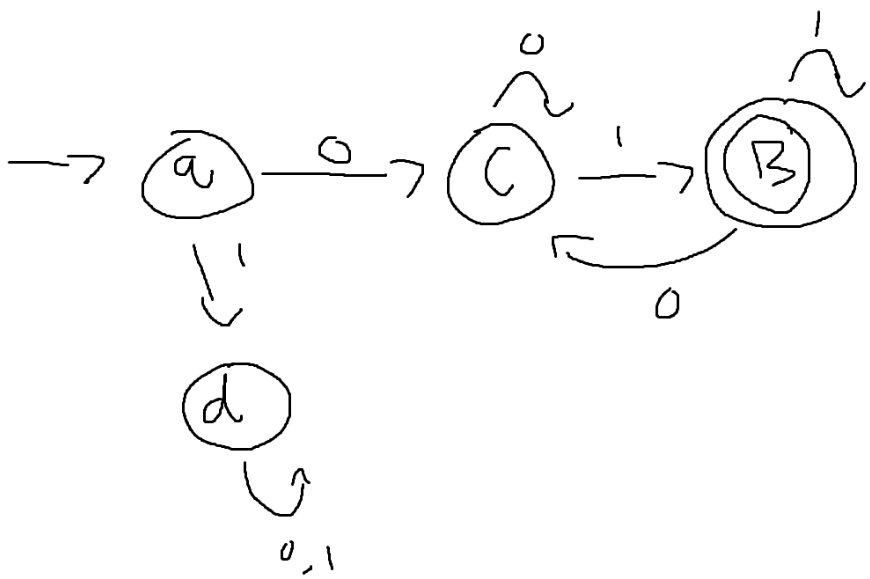
Basis: A ∩ B
Induction:
A ∩ B ≡ `A ∪ `B by DeMorgan’s Law
Here we can find the intersection between A and B and dinfe the differences where A ≠ B. By using DeMorgan’s Law we can find all the subsets of B in the language A.



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

<u>Equivalences:</u>
B=F
D=E



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

Let p = P/L constant

By contradiction let Leq be not regular

$\underset{x}{abb}\quad\underset{y}{abb}\quad\underset{z}{abb}$

$= |xy| \leq p$

<u>Let i = 0</u>

xy^0z

xz

$xy^0z \notin L$

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

3b. L = $\{a^n b^{2n} | n > 0$

Claim: Let leq be regular

Let p = P/L constant

By contradiction let Leq be not regular

Consider the string w = $a^n b^{2n} \varepsilon\ L$

w = $a^{n-þ}(a^{þ})b^{2n}$

w = $a^{n-þ}(a^{þ})^i b^{2n}$

a = $a^{n-þ}$

b = $(a^{þ})$

c = b^{2n}

<u>i = 0</u>

$a^{n-þ}(a^{þ})^0\ b^{2n}$

$a^{n-þ}b^{2n}$

xy^0z `ε $L$ (`ε == not epsilon)

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