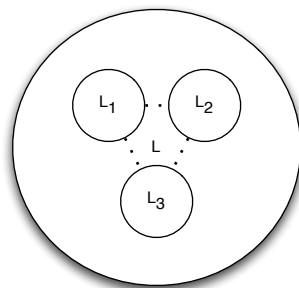


Recipes for using closure properties in proofs

Proving a language L is in a class C :

1. Start with a set of languages known to be in C .
2. Use operations under which C is closed to create L from languages in the set.
3. As all languages in the set were known to be in C and C is closed under the operations used to construct L , we can conclude that L must be in C .



Proving a language L is *NOT* in a class C :

1. Start with a set (possibly empty) of languages known to be in C .
2. Choose a language K known to *NOT* be in C .
3. Use operations under which C is closed to create K from L and other languages in the set.
4. Using proof by contradiction, suppose that L were in C . Then since L and all languages in the set are in C and C is closed under the operations used to construct K , we can conclude that K must be in C . But K is not in C , and hence our assumption that L was in C must have been incorrect.

