**Homework**

1. Show that (𝐴∪𝐶)∩(𝐵∪𝐶)⊆(𝐴∩𝐵)∪𝐶

Since A∩B⊆B and A∩B⊆A, we have

(𝐴∩𝐵)∪𝐶 ⊆B∪𝐶

(𝐴∩𝐵)∪C ⊆A∪𝐶

So, we have (𝐴∪𝐶)∩(𝐵∪𝐶)⊆(𝐴∩𝐵)∪C

2. Write each of the followings explicitly

a).

{e,1}{e,2}

b).

{1,2,{1,2}}X{1,2}

{1,{1,2}}{2,{1,2}}{{1,2},{1,2}}

1. Let . Show that the following relation is an equivalence relation on : if and only if .

(a,b) if f(a)=f(b), then it’s reflexive, symmetric and transitive, so R is an equivalence relation.

1. Let and be any two partial orders on the same set . Show that is a partial order.

Because partial orders closure under intersection

1. Show that any function from a finite set to itself contains a cycle.

Based on the pigeonhole principle, any function from a finite set to itself must have an edge to itself, so it contains a cycle.