**Assignment 4 – Part 1  
P378 Set 6.1: 12, 16, Set 6.2 : 4, 10, 14, Set 6.3: 12, 37, 42**

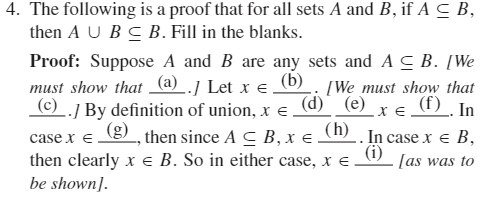
**Set 6.1: 12, 16**

12.a)   
12.b)   
12.c)   
12.d)   
12.e)   
12.f)   
12.g)   
12.h)   
12.i)   
12.j)

16.a) A ∪ ( B ∩ C ) (A ∪ B) ∩ C , (A ∪ B) ∩ (A ∪ C)   
**A ∪ ( B ∩ C ) and (A ∪ B) ∩ (A ∪ C) are equal**

16.b) A ∩ (B ∪ C) (A ∩ B) ∪ C , (A ∩ B) ∪ (A ∩ C)   
**A ∩ (B ∪ C) and (A ∩ B) ∪ (A ∩ C) are equal**

16.c) (A − B) – C A − (B − C)   
**These sets are not equal.**

**Set 6.2 : 4, 10, 14**

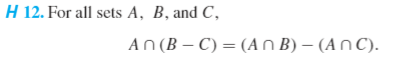
4.a)   
4.b)   
4.c)   
4.d)   
4.e) or  
4.f)   
4.g)   
4.h)   
4.i)   
  


10.) **Proof that :  
Suppose . By definition of intersection, and .  
Since then and . Since , then and . Hence, and , which means by definition of intersection. Since , [what we needed to show.]  
  
Proof that :  
Suppose It follows that and .   
By definition of intersection, if then and . Hence, , and .  
For , and , which we’ve proven to be the case.  
For and which we’ve proven to be the case.  
By definition of intersection,   
Thus, [what we needed to show.]**



14.) **Proof:  
Suppose and are sets with [We must show that .] Let . by definition of union. If then by definition of subsets. Because , by definition of union. Therefore, because and , [what we needed to show.]**

**P400 Set 6.3: 12, 37, 42**



12.) **Proof that :  
Suppose . Then and and . So it is true that and and that and . Thus, [what we needed to show.]  
  
Proof that   
Suppose . Then and , but , and so . Thus, [what we needed to show.]**



37.)   
 by De Morgan’s Laws  
 by Double Complement Law  
 by Set Difference Law  
 by De Morgan’s Laws  
 by Double Complement Law  
 by Absorption Laws



42.)   
 by Set Difference Laws  
 by De Morgan’s Laws  
 by Distributive Laws  
 by Complement Laws  
 by Commutative Laws  
 by Distributive Laws  
 by Commutative Laws  
 by Identity Laws  
 by Commutative & Associative Laws  
 by Complement Laws  
 by Idempotent Laws