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Individual Assignments #58

Assignment: Assignment: Section 2.2: 2, 4, 12, 16, 18, 20

# Q2

1. A∩B
2. A∩
3. A∪B

# Q4

# Q12

If then by definition of union.

Since (by definition of intersection) that implies that

And by definition for A so

Each is a subset of the other ⎕

# Q16

1. Implies: ; since x is an element of A one each side and it is joined conjunctively on the left it is a subset of the right.
2. Implies: since x is an element of A on both sides and it is the only case on the left side, it is a subset of the right.
3. Implies: ; since x is an element of A one each side and it is joined conjunctively on the left it is a subset of the right.
4. Implies: which expands to . by complement law; by the complement law.
5. Implies:   
   Focusing on the right side: by complememnt law and by identity law  
   thus ⎕

# Q18

1. Implies: it is clear that the left side is a subset of the right as appears on both sides and is disjunctively joined on the right.
2. Implies:. Since the left shows that x must be an element of A and of B and also C it is clear that it is a subset of the right which is all A and B.
3. Implies: . The left becomes and the right becomes by definition. Thus the left is a subset of the right again because of conjunction.
4. Implies: , which expands to:, focusing on gives by complement law, and ther rest is so it is by domination law.
5. If x is an element of B and not A OR C and not A then x is an element of B or C by not A, Implies:
6. , expand the left: .  
   The whole middle section is redundant, it is literally the same terms as the first so, removing and simplifiyingto leaves us with which is equivalent to the right side.

# Q20

Implies:

By the distributive law:

By the complement law:

By identity law:

Thus