Conditions

how to prove this equation A∩B⊂A⊂A⊂B

Solution

First of all there should be a little mistake, I think the correct conditions is how to prove:

$$(A \cap B) \subset A \subset (A \cup B)$$

Let's prove first:

$$(A \cap B) \subset A$$

As we know, the elements from $(A \cap B)$ are those elements, which are belong as to A as to B.

That's why each of these elements is in A, but if we take some element from A, but which is not in B, so it will not be in $(A \cap B)$. That's why $(A \cap B) \subset A$.

Now let's prove:

$$A \subset (A \cup B)$$

As we know, the elements from $(A \cup B)$ are those elements, which are belong to A **or** to B. Consider 2 sets A and B, which have not common points. For any element of A, it is belong to $(A \cup B)$, but let's take an element from B, it's not in A, but in $(A \cup B)$. That's why $A \subset (A \cup B)$

Q.E.D.