Lab6 Assignment

Deadline is on October 05, 2020 at 2pm. Submit on iCollege.

Show that if A, B, and C are sets, then

|A ⋃ B ⋃ C| = |A| + |B| + |C| – |A ⋂ B| – |A ⋂ C| – |B ⋂ C| + |A ⋂ B ⋂ C|

|A ⋃ B ⋃ C| |A| + |B| + |C|; every element in |A ⋃ B ⋃ C| is one of either A, B, or C.

Elements in A ⋂ B have been counted twice, while counting the elements in A and in B. The same goes with B ⋂ C and A ⋂ C.

So, we will need to subtract the cardinality of the sets, A ⋂ B, B ⋂ C, and C ⋂ A. Post subtraction, it is understood that the elements in A ⋂ B ⋂ C are not counted at all. We counted them thrice when we added the cardinalities of sets A, B, and C and also removed them thrice when we subtracted the cardinalities of A ⋂ B, B ⋂ C, and C ⋂ A.

|A ⋃ B ⋃ C| = |A| + |B| + |C| – |A ⋂ B| – |A ⋂ C| – |B ⋂ C| + |A ⋂ B ⋂ C|