Grade 10 C
Mathematics lesson 2

Topic: Complement of a set
The complement of a set is the set of all elements in the universal set that are not members of the given set. It is denoted by ' or c.

EXAMPLE 1
1. If E ={a b, c, d, e ,f, g} ,A = { a , b} and B ={ a , b ,c, d ,e } .find
    (a)   A'U B
    (b) (A u B)'

Solution

Notes: first find the union set of B .Thereafter A' (it means elements that are not in set A. Finally form set A'U B by combining the elements of A' and UB.

   (a) A'U B   UB = {a , b, c, d, e } A' = {c, d, e, f , g}
                               = A'U B={a, b, c, d ,e , f ,g}.
   (b) (AUB)'=AUB={ a, b, c, d, e}

        =(AUB)'={f, g}.   • first find AUB then the complement.

      EXAMPLE 2
    2. Given that set E ={1 , 2 , 3, 4, 5 ,6, 7}, A ={ 1, 2, 3, 4}, B ={ 1, 3, 4 ,5} and C ={ 2, 3, 4, 5} list:
        (a)   (A' U B) nC
        (b) (BUC)'UA
        (c) B'(AnC)

   Solutions

   (a) (A'UB)n C.   Notes: first deal with the set in the brackets (ie A'UB)
        A'={ 5, 6, 7} U B={ 1, 3 ,4,5}
      =(A'UB)={ 1,3 ,4, 5, 6, 7}n C ={2, 3, 4, 5}
      = (A'UB)nC ={3, 4, 5 }.   Here check the common elements.

(b) (BUC)'UA.   Hint: always start with the set in the brackets.

(BUC)' ={ 6, 7}UA={ 1, 2,3, 4} BUC)' it means elements that are not in Set B and C.

= (BUC)'UC ={ 1, 2, 3, 4, 6, 7}

(C) B'U(AnC)

= AnC ={ 2, 3, 4} B'= { 2, 6,7}

U(AnC)={1, 2, 3, 4, 5}.   Find AnC. Then U(AnC) is the correction of AnC and the union of both sets.

B'U(AnC)={ 1,2,3,4,5}

EXERCISE

1   Given that E={ 1,2,3,4,5,6} ,A={2, 3, 4} and B={ 5, 6}. List the sets
          (a) (AnB)'
          (b) A'UB

2.Given that E={ a, b, c, d, e, f, g} ,P={a, c, d, e }, Q={ b, d, e, f} and R={a, b, d, e}. List

          (c) (Q nR)UP'

    .   (b) P'U(QUR)

        (c) (R' nQ)UP

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