Essay on option 1

Sociology, Human Rights

Orlando Is an English man who is an actor. Given that the number of English men who act is so large Orlando belong to universal set of such actors. In addition, Orlando has acted in several Hollywood films therefore; he belongs to a universal set of Hollywood actors. Lastly, he is a married man thus he belongs to a universal set of actors who are married.

Option 2

Ordinal numbers are position numbers. There are several examples of its use in day to day life. For example, UN has ranked countries according to their ability of protecting human rights. If USA is 2rd i. e. position 2 in the rank it means that the USA government has only been challenged by one country globally in protecting human rights. Ordinal numbers are also used to rank candidates after they sit for their exams. Therefore, if peter is ranked 1 it means he was the best in class.

On the other hand, cardinal numbers are only counting numbers which place no emphasis on position. They are only used to measure size of sets. For example, one can go to a supermarket and buy one pen and one book. In this case one is a cardinal number and the items bought can be used to form a set P {book, pen} therefore the cardinal number of set p is n (P) = 2. In garden a farmer may plant 4 types of vegetables in this case 4 is used as a cardinal number.

Option 3:

I take a unit called maths for liberal arts therefore; I belong to a set of students who take this unit. Secondly, given that I rely on my parents to pay my school fees it means I belong to a set of those students in my class who

are sponsored by parents. Lastly, because I am not physically challenged it means I belong to set of students in my class who are not physically challenged.

Option 4:

How many elements must a set have if the number of proper subsets of the set is one-half of the total number of subsets of the set?

The number of proper subsets which are contained in any set is given by the formula; no. of proper subsets = 2n - 1 where n is the number of elements in the set. While, the number of subsets can be calculated by the formula; no. of subsets = 2n where n represents the number of elements in the set. If half of 2n - 1 is to be equal to 2n the following must hold

½(2n) = 2n – 1

Group like terms together

½ (2n) - 2n = -1

-1/2(2n) = -1 (multiply both sides by -2

2n= 2

n= log22

n= 1. The set must have only one element.

Option 5:

All the members of the board have to vote either to support additional wing to a hospital or reject an additional wing to a hospital. Therefore, if it assume that all this members are represented in a set it is possible to calculate the total subsets. There after a list of how voting took place can be listed down so as to select the voting where majority supported the idea(Allen & Dennis

2008).

No. of subsets = 2n n represents total elements i. e. number of the 4 board members

24 = 2 * 2 * 2 * 2 = 16

Therefore, there are 16 ways in which voting could take place. In the calculation of these subsets it is assumed that a subset will only contain a list of those who support the idea. If member one is represented by t, member 2 by a member 3 by a member 4 by e. the subsets will be as follow

{t , a, p, e}, {t, a, p}, {t, a, e}, {t, p, e}, {a, p, e},{t, a}, {t, p}, {t, e}, {a, p}, {a, e}, {p, e}, {t}, {a}, {p}, {e}, {}.

A majority vote is the one where the numbers of elements in the subsets are at least 3. These subsets are {t, a, p, e}, {t, a, p}, {t, a, e}, {t, p, e}, {a, p, e} and are the outcomes resulting to a majority supporting the establishment of a new wing.

Option 6

Let A= {1, 7, 9, 10)

B= {2, 6, 7, 8, 10)

If u= {1, 2, 3, 4, 5, 6, 7, 8, 9, 10}

$(A \cup B)' = A' \cap B'$

$(A \cup B) = \{1, 7, 9, 10) \cup \{2, 6, 7, 8, 10) = \{1, 2, 6, 7, 8, 9, 10)$

$(A \cup B)'$= elements not in $(A \cup B)$= {3, 4, 5}

Option 7:

Determine the following: (a) A and B, (b) B or C, (c) A' or C, (d) (B and C)' and C.

Part a)

A and B= A∩ B

But set A= set B

A and B= A∩ B= set B= set A

For example, if U = {1, 2, 3, 4, 5, 6, 7}

Then A= {1, 2, 3, 4, 5, 6, 7} C= {1, 2, 3, 4, 5, 6, 7} and B= {1, 2, 3, 4, 5, 6, 7}

A∩ B= {1, 2 , 3, 4, 5, 6, 7} ∩ {1 , 2 , 3, 4, 5, 6, 7}

= {1, 2 , 3, 4, 5, 6, 7}

Part b

B or C means B union c which refers to all elements of C and also elements of B.

U= {1, 2 , 3, 4, 5, 6, 7}

B = {1, 2 , 3, 4, 5, 6, 7}

C = {1, 2 , 3, 4, 5, 6, 7}

B or C= {1, 2, 3, 4, 5, 6, 7}

Part c

A' or C means elements which are not in A union elements in C. if

U= {1, 2, 3, 4, 5, 6, 7

C = {1, 2, 3, 4, 5, 6, 7}

A = {1, 2, 3, 4, 5, 6, 7}

A = { }

A' or C= { } U {1, 2, 3, 4, 5, 6, 7}

= {1, 2, 3, 4, 5, 6, 7}

Part d)

(B and C)' and C = elements in c intersecting with elements which are not within the intersection of Band C

(B and C)'= { }

(B and C) n C= { } n C= { }

Option 8:

Assuming U = {1, 2, 3, 4, 5, 6, 7, 8, 9, 10}A = { 1, 2, 3, 5, 7, 8}

B = {1, 6, 7, 8, 10}

C = {1, 2, 4, 7, 8, 9}

The left hand side

(A ∪ C)'= {6, 10}

(A ∪ C)'n (B) = {6, 10} n {1, 6, 7, 8, 10}= {6, 10}

The right hand side

(A n C)' = {4, 5, 6, 9, 10}

(A n C)' n (B) = {4, 5, 6, 9, 10} n ({1, 6, 7, 8, 10}

= {6, 10}

Therefore, because {6, 10} = {6, 10}.

References

Allen R. & Dennis C. 2008. A Survey of Mathematics with Applications with MyMathLab Student Access Kit, Expanded Edition (8th Edition).