ECE 139 Homework 1

Due 4/6/22 8pm

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Problem 1

A. S = {1,2,3,4,5,6}

B. {1,2,3,4,5,6}

C. {3,5}

D. {4}

E. {2,6}

Problem 2

A. No, it is possible that B is a subset of C or C is a subset of B.

B. No, it is possible that B is a subset of C or C is a subset of B.

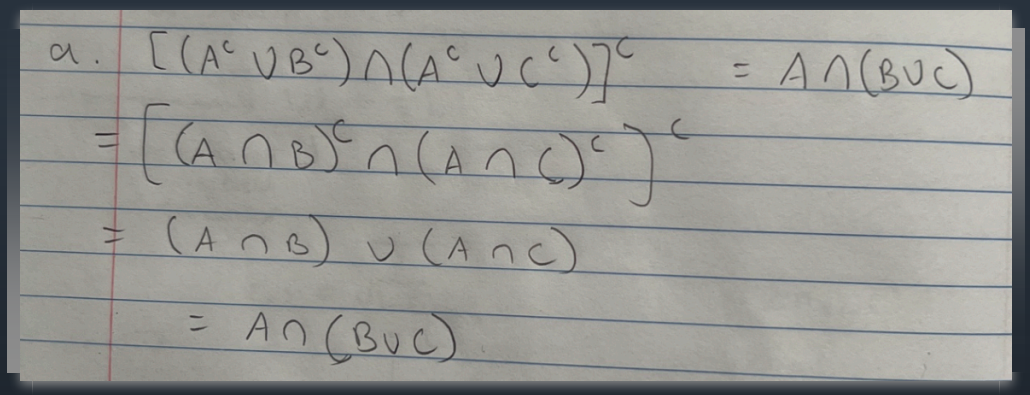
C. (A-B)-C $\neq$ A-(B-C) when B and C are identical sets.

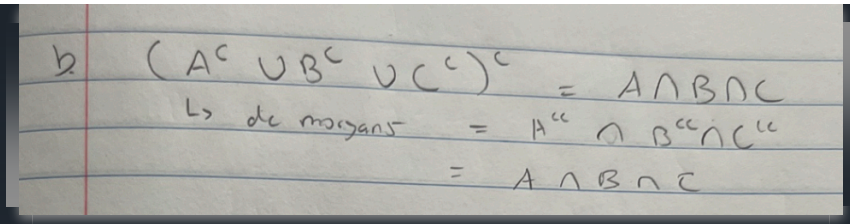
(A-B)-C $=$ (A-C)-B

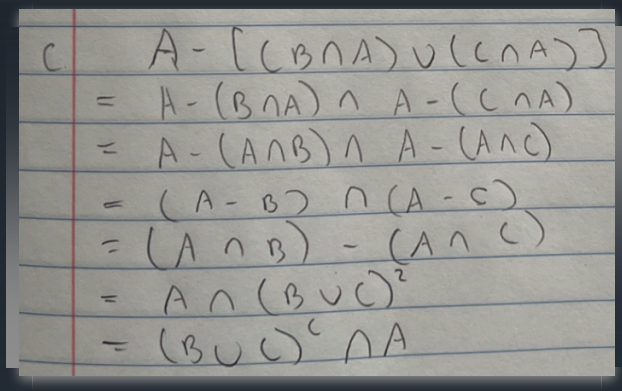
(A-B)-C $= A \bigcap (B^c \bigcap C^c)$

(A-B)-C $=$ A-(B $\bigcup$ C)

Problem 3







Problem 4

A. (A),(B),(C),(A,B),(A,C),(B,C),(A,B,C),(ϕ)

B. Subsets consist of all combinations of elements in a set. For each element in a subset, we have the choice of adding it to the subset or not adding it to the subset (2 options). Depending on the number of elements in the original set, we can say there are 2x2x2x2... subsets depending on the number of elements, or 2^n subsets for a given set with n elements.

H3

C. There are 2^{n-k} subsets from B that are not mutually exclusice with C because there are (n-k) elements in B that are not in the given subset.

D. $k * 2^{n-k}$

Problem 5

A. 2^6

B. 2^2

C. $2^3 + 2^2 + 2 + 1$

H3

Problem 6

A. $5^4 = 625$

B. 5 * 4 * 3 * 2 = 120

C. 4x4x4x4 = 4^4 = 256 for part a

H3

4x3x2 = 4! = 24 for part b