

CISC1100, Homework 2

Fall 09, due Sept 25

Textbook P.28-30:

1.6 Use set builder notation to define the set $A=\{2,4,8, \dots\}$

Ans: $\{x \mid x=2^y \text{ where } y \in \mathbb{Z}^+\}$

1.7

Only statements (a), (c) and (f) are true.

1.14

This would only be true if set A and set B shared no common elements. Remember that a set cannot contain duplicate elements, therefore if there were any common elements between the set A and the set B, they would only be listed once in the union of those two sets.

1.15

(a) C^c , or U-C

(b) $B \cap D$

(c) $A \cap B$

(d) $A \cap D^c$, or A-D

(e) $B^c \cap D^c$, or $B^c - D$,

(f) $C - A$, or $C \cap A^c$

(g) $D \cup C$,.

Provide your argument for Inclusion-Exclusion Rule which is as follows:

$$|A \cup B| = |A| + |B| - |A \cap B|$$

Hint: You can use Venn Diagram.

Sol: Draw the Venn Diagram and shade the area corresponding to $A \cup B$. To count the number of elements in $A \cup B$, we can count the number of elements in A, add

the number of elements in B, and then subtract the number of elements in $A \cap B$ (as the common elements of A and B are counted twice).