Discrete Structures.

Tutorial 1. PG-43. Jaynam Modi.

1. The power set of any set is defined as the set of all subsets of the given set including the empty set and the given set itself.

given, $A = \{10, 2, 3, 4\}$

Power set of A, $P(A) = \{\emptyset, \{10\}, \{2\}, \{3\}, \{4\}, \{10,2\}, \{10,3\}, \{10,4\}, \{2,3\}, \{2,4\}, \{3,4\}, \{10,2,3\}, \{10,3,4\}, \{10,4\}, \{10,2,4\}, \{2,3,4\}, \{10,2,3,4\}\}$.

2. given, $A = \{99, 12, 3, 4, 50\}$

& $B = \{99, 12, 50, 4, 3\}$.

hence, set B is NOT a proper subset of set A since sets are defined as unordered collections of unique entities, hence, no matter the order the elements are placed in or the position of any individual

element, the sets are equal if all elements of set A are the same as all elements of set B.

hence, here, A = B, thus B is not a proper subset of A.

3.

(a) $A = \emptyset$ [rooster form]

$A = \{x : 50 < x < 51, x = 2n+1 \ \forall \ n \in N\}$

[set builder form]

since A is a null set, its cardinality is 0.

(b) $B = \{1, 2, 3, 4\}$ [rooster form]

$B = \{x : x^3 < 100, x > 0, x \in Z\}$.

the cardinality of B is 4.

4. $E = \{x : x = 3y - 10, y \leq 5, y \in N\}$.

hence, $E = \{-7, -4, -1, 2, 5\}$

5. $A = \{1, 2, 3, 4, 5, 6\}$ & $B = \{1, 3, 5, 7, 9\}$

(a) $A \cup B = \{1, 2, 3, 4, 5, 6, 7, 9\}$

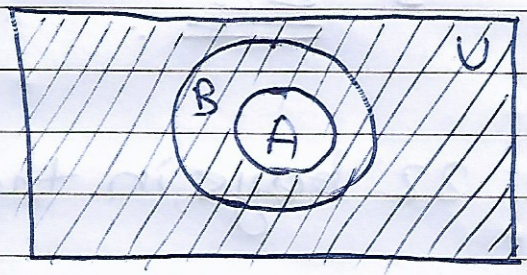
(b) $A \cap B = \{1, 3, 5\}$

(c) $A - B = \{2, 4, 6\}$

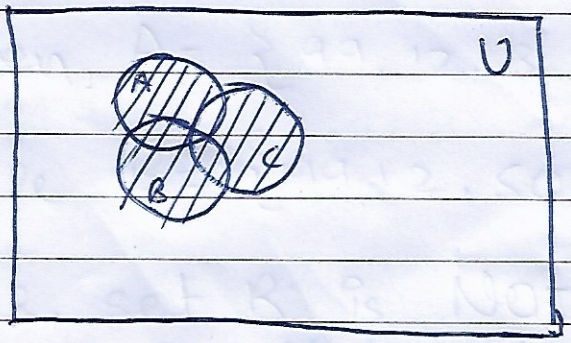
(d) $B - A = \{7, 9\}$

6.

(a) $(A \subset B)'$



(b) $A \cup B \cup C$



7. Let A = boys who have dell laptops = 18.

B = boys who have HP laptops = 10.

Hence, boys who have both = $A \cap B = 6$.

thus, total number of boys

$= A + B - (A \cap B)$

$= 18 + 10 - (6)$

$= 22$

Hence, there are 22 boys in the class.