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Q.11)	Show that if $A \subset B$ then, $(C-B) \subset (C-A)$.	
Sol.11)	Given: $A \subset B$ To prove, $(C-B) \subset (C-A)$ Let $x \in (C-B)$ $\Rightarrow x \in (C \cap B^1)$ ………… $\{\because \mathrm{A} - \mathrm{B} = \mathrm{A} \cap \mathrm{B}^1\}$ $\Rightarrow x \in C \; and \; x \in \mathrm{B}^1$ $\Rightarrow x \in C \; and \; x \notin \mathrm{B}$ $\Rightarrow x \in C \; and \; x \notin \mathrm{A}$ …………. $\{\because \mathrm{A} \subset \mathrm{B} \text{ if } x \notin \mathrm{B} \text{ then } x \notin \mathrm{A}\}$ $\Rightarrow x \in C \; and \; x \in \mathrm{A}^1$ $\Rightarrow x \in (C \cap \mathrm{A}^1)$ $\Rightarrow x \in (C - \mathrm{A})$ $\Rightarrow (C-B) \subset (C - \mathrm{A})$ (proved)	
Q.12)	Let A,B and C be the sets such that $A \cup B = A \cap C$. Show that B = C.	
Sol.12)	Given: $(A \cup B) = (A \cap C)$ and $= A \cap B = A \cup C$ To prove, B = C We have, $A \cap B = A \cup C$ $\Rightarrow B \cap (A \cup B) = B \cap (A \cap C)$ $\Rightarrow (B \cap A) \cup (B \cup B) = (B \cap A) \cup (B \cap C)$ ………… $\{distributive \; law\}$ $\Rightarrow (A \cap B) \cup (B) = (A \cap B) \cup (B \cap C)$ $\Rightarrow B = (A \cap B) \cup (B \cap C)$ …. (1)….. $\{elements \; of \; A \cap B \; always \; belongs \; to \; B\}$ Again, $A \cup B = A \cup C$ ……. (taking same equation again) $\Rightarrow C \cap (A \cup B) = C \cap (A \cup C)$ $\Rightarrow (C \cap A) \cup (C \cap B) = (C \cap A) \cup (C \cap C)$………… $\{distributive \; law\}$ $\Rightarrow (A \cap C) \cup (B \cap C) = (A \cap C) \cup C$ $\Rightarrow (A \cap C) \cup (B \cap C) = C$ $\Rightarrow (A \cap B) \cup (B \cap C) = C$ ……(2)…… $\left(\text{Given: } (A \cup B) = (A \cap C)\right)$ From (1) and (2), B = C (proved)	
Q.13)	If $A \cap X = B \cap X = \emptyset$, show that A = B.	
Sol.13)	Given: $A \cup X = B \cup X$ $A \cap X = B \cap X = \emptyset$ To prove: A = B We have, $A \cup X = B \cup X$ $\Rightarrow A \cap (A \cup X) = A \cap (B \cup X)$ $\Rightarrow (A \cap A) \cup (A \cup X) = (A \cap B) \cup (A \cap X)$………… $\{distributive \; law\}$ $\Rightarrow A \cup \not\subset = (A \cap B) \cup \emptyset$ …………. $(given \; A \cap X = \emptyset)$ $\Rightarrow A = (A \cap B)$ ………… $(given, A \cup \not\subset = \mathrm{A})$ Again, $\mathrm{A} \cup \mathrm{X} = \mathrm{B} \cup \mathrm{X}$ $\Rightarrow B \cap (A \cup X) = B \cap (B \cup X)$ $\Rightarrow (B \cap A) \cup (B \cap X) = (B \cap B) \cup (B \cap X)$ $\Rightarrow (A \cap B) \cup \not\subset = \mathrm{B} \cup \not\subset$ …………. $(given \; A \cap X = \emptyset)$	

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	$\Rightarrow A = (A \cap B)$ ………… $(given, B \cap X = \emptyset)$ $\Rightarrow (A \cap B) = \mathrm{B}$ …….. (2) From (1) and (2), A = B (proved)
Q.14)	Show that (i) $A = (A \cap B) \cup (\mathrm{A} - \mathrm{B})$, (ii) $A \cup = (B - A) = A \cup B$.
Sol.14)	(i)Taking R.H.S. = $(A \cap B) \cup (\mathrm{A} - \mathrm{B})$ = $(A \cap B) \cup (A \cap B^1)$ = $A \cup (A \cap B^1)$………… $\{distributive\ law\}$ = $A \cap \cup$ …………. $\{\because A \cup A^1 = \cup\}$ = A = L.H.S. (proved) (ii) Taking L.H.S. = $\cup = (B - A)$ = $A \cup (B \cap A)$ = $(A \cup B) \cap (A \cup A^1)$………… $\{distributive\ law\}$ = $(A \cup B) \cap \cup$ = $A \cup B$ = R.H.S. (proved)
Q.15)	Find sets A,B and C such that $A \cap B, B \cup C, A \cup C$ are non-empty sets and $A \cap B \cap C$ is an empty set.
Sol.15)	Let $A = \{1,2\}$ $B = \{2,3\}$ $C = \{1,3\}$ $A \cap B = \{2\}: B \cap C = \{3\}: C \cap A = \{1\}$ and $A \cap B \cap C = \not\subset$ ans.

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