

Solution of Questions

Question 1	Solution of Question
A) 1)	$K = \{x \in \mathbb{Z} / -1 \leq x \leq 7\}$ $A = \{x \in K / x \text{ is an odd number, } x > -1\}$ Or $A = \{x \in \mathbb{N} / x \text{ is an odd number}\}$ $B = \{x \in K / x \text{ is an even number}\}$ Or $B = \{x \in \mathbb{N} / x \text{ is an even number, } x > 0\}$
2)	$K = \{-1, 0, 1, 2, 3, 4, 5, 6, 7\}$ So, if $x = -1$, then $(-1)^2 \leq 4$ <i>true</i> if $x = 0$, then $(0)^2 \leq 4$ <i>true</i> if $x = 1$, then $(1)^2 \leq 4$ <i>true</i> if $x = 2$, then $(2)^2 \leq 4$ <i>true</i> if $x = 3$, then $(3)^2 \leq 4$ <i>false</i> if $x = 5$, then $(5)^2 \leq 4$ <i>false</i> if $x = 6$, then $(6)^2 \leq 4$ <i>false</i> if $x = 7$, then $(7)^2 \leq 4$ <i>false</i> $C = \{-1, 0, 1, 2\}$ $D = \{2, 3, 6\}$ $E = \{2, 3, 5, 7\}$
3)	$B \cap C \cap D = \{2\}$ $\overline{B} = \{-1, 1, 3, 5, 7\}$ and $A = \{1, 3, 5, 7\}$, then $A \cup \overline{B} = \overline{A} \cap B = \{0, 2, 4, 6\}$ $Card(P(C)) = 2^4 = 16$ subsets $A \cap B = 1$ element = $\{\emptyset\}$ $card P(A \cap B) = 2^0$ $P(D) = \{\{\emptyset\}, \{2\}, \{3\}, \{6\}, \{2, 3\}, \{2, 6\}, \{3, 6\}, \{2, 3, 6\}\}$
4)	$\overline{A} = \{-1, 0, 2, 4, 6\}$ and $\overline{B} = \{-1, 1, 3, 5, 7\}$ $card(\overline{A \cap B}) = card(\overline{A \cup B})$ $= card(E - A) + card(E - B) + card(\overline{A \cup B})$ $9 = 5 + 5 - 1 = 9$ (True)

B)	$-5 \in K ; 2 \in K ; \{1,3,5\} \subset A ; \{0; 1\} \subset C ; N \subset Z$ $N \cap Z = N ; N^* \cap \{0\} = \emptyset ; N^* \cup \{0\} = N$
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Question 2	Solution of Question
1)	$E = \{x \in \mathbb{N}^* / x \leq 8\}$ or $E = \{x \in \mathbb{Z} / 1 \leq x \leq 8\}$ $A = \{x \in E / x \text{ is a prime number}\}$ $B = \{x \in E / x \text{ is an even number and } x < 8\}$
2)	$C = \{1,2,5,6\}$
3)	$A \cap B \cap C = \{2\}$ $\text{card}(A \cap B \cap C) = 1 \text{ element}$ $\text{card}(P(A \cap B \cap C)) = 2^1 = 2 \text{ element } \{\{\emptyset\}, \{2\}\}$
4)	$B \cup C = \{1,2,4,5,6\}$ $A \cap (B \cup C) = \{2,5\}$ $\overline{A} = \{1, 4, 6, 8\}$ $\overline{A \cap B} = A \cup \overline{B} = \{1,2,3,5,7,8\}$ $\overline{A \cup B \cup C} = \{8\}$

Question 3	Solution of Question
	$A \cap B = \{5, 6, 7\}$, $\text{card}(A) = 5$, $\text{card}(B) = 4$, $\overline{A} = \{3, 4, 8\}$ and $\overline{B} = \{1, 2, 3, 4\}$ $\overline{A} = \{3, 4, 8\} \leftrightarrow A = \{5, 6, 7, ?, ?\}$ $\overline{A} = \{1, 2, 3, 4\} \leftrightarrow B = \{5, 6, 7, ?\}$ $\text{But } 3 \text{ and } 4 \in \overline{A} \text{ and } \overline{B} \leftrightarrow 3 \text{ and } 4 \notin A \text{ and } B, \text{ then}$ $3 \text{ and } 4 \in E$ $A = \{1, 2, 5, 6, 7\}$ $B = \{5, 6, 7, 8\}$ $E = \{1, 2, 3, 4, 5, 6, 7, 8\}$