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SETS

PERIOD -4

SUBJECT : MATHEMATICS
CHAPTER NUMBER: 6
CHAPTER NAME :SETS

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Learning outcome

Students will be able to understand about operation of sets

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Previous knowledge:

1) If C is the set of letters in the word “cooler”, find :

(i) Set C

(ii) n(C)

(iii) Number of its subsets

(iv) Number of its proper subsets.

Note : (i) If a set has n elements, the number of its subsets = 2^n

(ii) If a set has n elements, the number of its proper subsets = $2^n - 1$

Solution:

2) If T = {x : x is a letter in the word ‘TEETH’}, find all its subsets.

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Exercise 6D

1) Given $A = \{x : x \in N \text{ and } 3 < x \leq 6\}$ and $B = \{x : x \in W \text{ and } x < 4\}$. Find :

(*i*) Sets A and B in roster form

(*ii*) $A \cup B$ (*iii*) $A \cap B$.

(*iv*) $A - B$ (*v*) $B - A$

Sol:

(*i*) $A = (4, 5, 6)$

$B = (0, 1, 2, 3)$

(*ii*) $A \cup B = \{0,1,2,3,4,5,6\}$

(*iii*) $A \cap B = (\phi)$

(*iv*) $A - B = (4, 5, 6)$

(*v*) $B - A = (0, 1, 2, 3)$

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Exercise 6D

2) If $P = \{x : x \in W \text{ and } 4 \leq x \leq 8\}$, and $Q = \{x : x \in N \text{ and } x < 6\}$. Find :

(i) $P \cup Q$ and $P \cap Q$.

(ii) Is $(P \cup Q) \supset (P \cap Q)$?

Sol:

(i) $P = (4, 5,, 6, 7, 8)$

$Q = (1, 2, 3, 4, 5)$

$P \cup Q = (1, 2, 3, 4, 5, 6, 7, 8)$

$P \cap Q = (4, 5)$

(ii) Yes, all the element of set $P \cup Q$ are contained in the set $P \cap Q$. Therefore $P \cup Q$ is a proper subset of $P \cap Q$.

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3)

$A = (5, 6, 7, 8, 9)$

$B = (4, 5, 6, 7)$

$C = (1, 2, 3, 4, 5)$

(i) $A \cup B = (4, 5, 6, 7, 8, 9)$

$(A \cup B) \cup C = (1, 2, 3, 4, 5, 6, 7, 8, 9)$

(ii) $B \cup C$ $(1, 2, 3, 4, 5, 6, 7)$

$A \cup (B \cup C) = (1, 2, 3, 4, 5, 6, 7, 8, 9)$

(iii) $A \cap B = (5, 6, 7)$

$(A \cap B) \cap C = (5)$

(iv) $B \cap C = (4, 5)$

$A \cap (B \cap C) = (5)$

(v) $(A \cup B) \cup C = (1, 2, 3, 4, 5, 6, 7, 8, 9)$

$A \cup (B \cup C) = (1, 2, 3, 4, 5, 6, 7, 8, 9)$

Yes, these are equal.

(vi) $(A \cap B) \cap C = A \cap (B \cap C)$

$\{5\} = \{5\}$

Yes, these are equal.

Home assignment

Ex 6(D) – 8,9

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THANKING YOU

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