

PERSONAL PAPER

PANDEYPUR

QUESTION BANK (SETS)

Class 11 - Mathematics

1. The number of subsets (Improper) of a set containing n elements is [1]
a) 2^n b) $2^n - 1$
c) $2^n - 2$ d) n
2. Two finite sets have m and n elements respectively. The total number of subsets of first set is 56 more than the total number of subsets of the second set. The values of m and n respectively are. [1]
a) 5, 1 b) 7, 6
c) 8, 7 d) 6, 3
3. If $A = \{x : x \neq x\}$ represents [1]
a) $\{1\}$ b) $\{ \}$
c) $\{x\}$ d) $\{0\}$
4. For any two sets A and B , $A \cup B = A$ if [1]
a) $A = B$ b) $B \in A$
c) $A \neq B$ d) $B \subseteq A$
5. For any two sets A and B , $A \cap (A \cup B) = \dots$ [1]
a) none of these b) B
c) ϕ d) A
6. Let F_1 be the set of parallelograms, F_2 the set of rectangles, F_3 the set of rhombuses, F_4 the set of squares and F_5 the set of trapeziums in a plane. Then F_1 may be equal to [1]
a) $F_2 \cap F_3$ b) $F_3 \cap F_4$
c) $F_2 \cup F_5$ d) $F_2 \cup F_3 \cup F_4 \cup F_1$
7. Let $A = \{x : x \notin \mathbf{R}, x \geq 4\}$ and $B = \{x : x \notin \mathbf{R}, x < 5\}$ then $A \cap B$ is [1]
a) $\{5, 4\}$ b) $\{4, 5\}$
c) $\{4\}$ d) $\{x : x \in \mathbf{R}, 4 \leq x < 5\}$
8. If sets A and B are defined as $A = \{(x, y) | y = \frac{1}{x}, 0 \neq x \in \mathbf{R}\}$, $B = \{(x, y) | y = -x, x \in \mathbf{R}\}$, then [1]
a) $A \cap B = A$ b) $A \cup B = A$
c) $A \cap B = \phi$ d) $A \cap B = B$
9. If $A \subset B$, then [1]

50. Given $L = \{1, 2, 3, 4\}$, $M = \{3, 4, 5, 6\}$ and $N = \{1, 3, 5\}$ Verify that $L - (M \cup N) = (L - M) \cap (L - N)$ [2]
51. Let A and B be two sets. Then, prove that $A = B \Leftrightarrow A \subseteq B$ and $B \subseteq A$. [2]
52. If $A = \{x : x \in \mathbb{N}, x \leq 7\}$, $B = \{x : x \text{ is prime, } x < 8\}$ and $C = \{x : x \in \mathbb{N}, x \text{ is odd and } x < 10\}$, verify that: $A \cap (B \cup C) = (A \cap B) \cup (A \cap C)$ [2]
53. Write the set $A = \{a_n : n \in \mathbb{N}, a_{n+1} = 3a_n \text{ and } a_1 = 1\}$ in the roster form. [2]
54. Is the pair of set $A = \{2, 3\}$ and $B = \{x : x \text{ is solution of } x^2 + 5x + 6 = 0\}$ equal? Give reason. [2]
55. Write the set in roster form: $D = \{x : x \text{ is an integer, } x^2 \leq 9\}$ [2]
56. Let A, B and C be three sets, then prove that: $A - (B - C) = (A - B) \cap (A \cap C)$ [3]
57. List element of the given set: $A = \{x : x \text{ is an odd natural number}\}$ [3]
58. For all sets A, B and C [3]
Is $(A - B) \cap (C - B) = (A \cap C) - B$?
Justify your answer.
59. Using properties of set prove the statement. For all sets A and B, prove that $A \cup (B - A) = A \cup B$. [3]
60. In a survey of 60 people, it was found that 25 people read newspaper H, 26 read newspaper T, 26 read newspaper I, 9 read both H and I, 11 read both H and T, 8 read both T and I, 3 read all three newspapers. Find the number of people who read exactly one newspaper. [3]
61. Let A and B be two sets. If $A \cap X = B \cap X = \phi$ and $A \cup X = B \cup X$ for some set X, prove that $A = B$. [3]
62. If $A \subset B$, show that $(B' - A') = \phi$. [3]
Hint $A \subset B \Rightarrow B' \subset A' \Rightarrow B' - A' = \phi$.
63. Is the set of lines which are parallel to the x-axis finite or infinite? [3]
64. Let A and B be two sets. Using properties of sets prove that: [3]
i. $A \cap B' = \phi \Rightarrow A \subset B$
ii. $A' \cup B = U \Rightarrow A \subset B$
65. List all the element of the sets: $H = \{x : x \in \mathbb{Z}, |x| \leq 2\}$ [3]
66. State whether the statements is true or false: $\{2, 3, 4, 5\}$ and $\{3, 6\}$ are disjoint sets. [3]
67. If $U = \{2, 3, 5, 7, 9\}$ is the universal set and $A = \{3, 7\}$, $B = \{2, 5, 7, 9\}$, then prove that: $(A \cap B)' = A' \cup B'$. [3]
68. Let A, B and C be sets. Then show that [3]
 $A \cap (B \cup C) = (A \cap B) \cup (A \cap C)$
69. In a survey of 60 people, it was found that 25 people read newspaper H, 26 read newspaper T, 26 read newspaper I, 9 read both H and I, 11 read both H and T, 8 read both T and I, 3 read all three newspapers. Find the number of people who read at least one of the newspaper. [3]
70. Assume that $P(A) = P(B)$ show that $A = B$. [3]
71. Out of 100 students; 15 passed in English, 12 passed in Mathematics, 8 in Science, 6 in English and Mathematics, 7 in Mathematics and Science, 4 in English and Science, 4 in all the three. Find how many passed [3]
i. in English and Mathematics but not in Science
ii. in Mathematics and Science but not in English
iii. in Mathematics only
iv. in more than one subject only
72. Let $A = \{a, e, i, o, u\}$, $B = \{a, d, e, o, v\}$ and $C = \{e, o, t, m\}$. Using Venn diagrams, verify that: $A \cup (B \cap C) = (A \cup B) \cap (A \cup C)$ [3]
73. Let $A = \{2, 4, 6, 8, 10\}$, $B = \{4, 8, 12, 16\}$ and $C = \{6, 12, 18, 24\}$. Using Venn diagrams, verify that: $(A \cup B) \cup C = A \cup (B \cup C)$ [3]

74. If $U = \{1, 2, 3, 4, 5, 6, 7, 8, 9\}$, $A = \{2, 4, 6, 8\}$ and $B = \{2, 3, 5, 7\}$, verify that: $(A \cap B)' = A' \cup B'$. [3]
75. Let A , B and C be three sets such that $A \cup B = C$ and $A \cap B = \phi$ then prove that $A = C - B$. [3]