S.D. Public School, Pitampura

Class XI

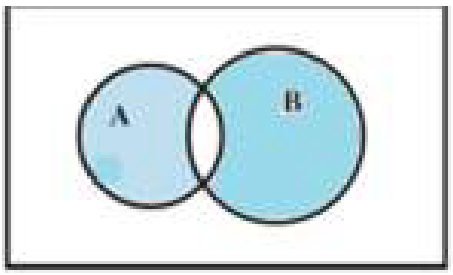
2025-26

Applied Mathematics

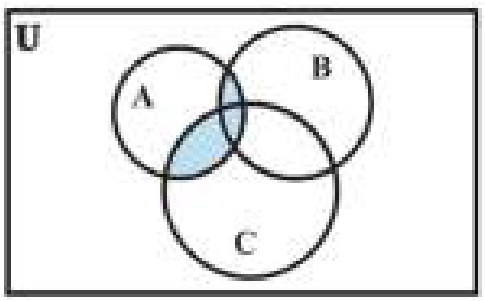
Holiday's Homework Assignment

1. Write the set $\left\{\frac{1}{2},\frac{2}{3},\frac{3}{4},\frac{4}{5},\frac{5}{6},\frac{6}{7},\frac{7}{8}\right\}$ in set builder form
2. Write the interval (6,12] in set builder form
3. Let A = {1,2,3,}, B = {1,2,3} and C = {2,4}. Find all sets X satisfying the conditions: $X \subset B, X \neq B$ and $X \not\subset C$
4. Show that for any two Sets A and B
   $A = (A \cap B) \cup (A - B)$
5. If A = {2,4,6,8,10}, B = {1,2,3,4,5,6,7} and C= {2,6,7,10}, then show that
   $A - (B \cup C) = (A - B) \cap (A - C)$
6. A market research group conducted a survey of 1000 consumers and reported that 720 consumers like product A and 450 consumers like product B, what is the least number that must have liked both products?
7. Find the number of subsets of a set having 4 elements.
8. If A = {x : x is an even natural number} and B = {x : x is a prime number}, then find A-B
9. Write the set B = {3, 9, 27, 81} in set-builder form.
10. Let A and B be two sets having 5 and 7 elements respectively. Write the minimum and maximum number of elements in (i) A ∩ B (ii) A ∪ B
11. If U = { x : x ∈ N and x ≤ 10}, A = { x : x is prime and x ≤ 10} and B = { x : x is a factor of 24}
    Verify the following result
    (i) A – B = A ∩ B' (ii) (A ∪ B)′ = A′ ∩ B′ (iii) (A ∩ B)′ = A′ ∪ B′
12. What is represented by the shaded regions in each of the following Venn-diagrams?

(i)



(ii)



13. On the Real axis, If A = [0, 3] and B = [2, 6], then find the following
(i) A' (ii) $A \cup B$ (iii) $A \cap B$ (iv) $A - B$

14. Two sets A and B are such that $n(A \cup B) = 21, n(A' \cap B') = 9, n(A \cap B) = 7$, find $n(A \cap B)'$

15. A survey shows that 63% people watch news channel whereas 76% people watch news channel B. If x% of people watch both news channels, then prove that $39 \leq x \leq 63$.

16. Two finite sets have m and n elements. The number of elements in power set of first is 48 more than number of elements in power set of the other, values of m and n are

17. Draw the Venn diagrams to illustrate the following relationship among sets E, M and U, where E is the set of students studying English in a school, M is the set of students studying Mathematics in the same school, U is the set of all students in that school.
(i) All the students who study Mathematics study English, but some students who study English do not study Mathematics.
(ii) Some of the student study Mathematics but do not study English, some study English but do not study Mathematics, and some study both.

18. There are 200 individuals with a skin disorder, 120 had been exposed to the chemical C_1, 50 to chemical C_2, and 30 to both the chemicals C_1 and C_2. Find the number of individuals exposed to
(i) Chemical C_1 but not chemical C_2
(ii) Chemical C_2 but not chemical C_1
(iii) Chemical C_1 or C_2

19. In a town of 10,000 families, it was found that 40% families buy newspaper A, 20% families buy newspaper B and 10% families by newspaper C. 5% families buy A and B, 3%, buy B and C and 4% buy A and C. If 2% families buy all the three newspapers, find the no. of families which buy (1) A only (2) B only (3) none of A, B and C (4) exactly two newspapers (5) exactly one newspaper (6) A and C but not B (7) at least one of A, B, C.

20. 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
(i) In English and Mathematics but not in science
(ii) In Mathematics only
(iii) In more than one subject only

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Prepare a project on any one of the suggested projects:

List of Suggested projects:

1. Use of Venn diagram in solving practical problems
2. The cardinality of a set and orders of infinity
3. Fibonacci sequence: Its' history and presence in nature
4. Investigating Graphs of functions for their properties
5. Prepare a questionnaire to collect information about money spent by your friends in a month on activities like travelling, movies, recharging of the mobiles, etc. and draw interesting conclusions
6. Check out the local newspaper and cut out examples of information depicted by graphs. Draw your own conclusions from the graph and compare it with the analysis given in the report
7. Analysis of population migration data – positive and negative influence on urbanization
8. Each day newspaper tells us about the maximum temperature, minimum temperature, and humidity. Collect the data for a period of 30 days and represent it graphically. Compare it with the data available for the same time period for the previous year
9. Analysis of career graph of a cricketer (batting average for a batsman and bowling average for a bowler). Conclude the best year of his career. It may be extended for other players also – tennis, badminton, athlete
10. Vehicle registration data – correlating with pollution and the number of accidents
11. Visit a village near Delhi and collect data of various crops over the past few years from the farmers. Also, collect data about temperature variation and rain over the period for a particular crop. Try to find the effect of temperature and rain variations on various crops