

MATHS ACADEMY-BY PRACHI MA'AM
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XI-EXTRA WORKSHEET

CH-1 SETS

1. If A and B are two sets such that $n(A) = 70, n(B) = 60, n(A \cup B) = 110$, then $n(A \cap B)$ is equal to
a) 249 b) 50 c) 40 d) 20
2. Let U be the universal set containing 700 elements. If A, B are subsets of U such that $n(A) = 200, n(B) = 300$ and $n(A \cap B) = 100$, Then $n(A' \cap B')$ =
a) 400 b) 600 c) 300 d) none of these
3. If $A = \{1, 2, 3, 4, 5\}$, then the number of proper subsets of A is
a) 120 b) 30 c) 31 d) 32
4. If $A = \{1, 3, 5, B\}$ and $B = \{2, 4\}$, then
a) $4 \in A$ b) $\{4\} \subset A$ c) $B \subset A$ d) none of these
5. For any sets $A, (A')'$ is equal to
a) A b) A' c) ϕ d) none of these
6. Let A and B be two sets in the same universal set. Then $A - B =$
a) $A \cap B$ b) $A' \cap B$ c) $A \cap B'$ d) none of these
7. If $a \in N$ such that $aN = \{ax : x \in N\}$. Describe the set $3N \cap 7N$.

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8. Let $U = \{1, 2, 3, 4, 5, 6, 7, 8, 9\}$, $A = \{1, 2, 3, 4\}$ and $B = \{2, 4, 6, 8\}$ and $C = \{3, 4, 5, 6\}$. Find:

- a) A' b) B' c) $(A \cap C)'$
d) $(A \cup B)'$ e) $(A')'$ f) $(B - C)'$

9. A survey of 500 television viewers produced the following information; 285 watch football, 195 watch hockey, 115 watch basketball, 45 watch football and basketball, 70 watch football and hockey, 50 watch hockey and basketball, 50 do not watch any of the three games. How many watch all the three games? How many watch exactly one of the three games?

10. In a survey of 100 persons, it was found that 28 read magazines A , 30 read magazines B , 42 read magazines C , 8 read magazines A and B , 10 read magazines A and C , 5 read magazines B and C and 3 read all the three magazines. Find:

- a) How many read none of the three magazines?
b) How many read magazine C only?
c) How many read magazines B and C but not A ?
d) How many read magazine A only?

11. Let $A = \{a, b, c, d\}$, $B = \{a, b, c\}$ and $C = \{b, d\}$. Find all the sets X such that:

- a) $X \subset B$ and $X \subset C$
b) $X \subset A$ and $X \not\subset B$.

12. Let A , B and C be three sets. If $A \in B$ and $B \subset C$, is it true that $A \subset C$? If not give an example.

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13. Match each of the sets on the left in the roster form with the same on the right described in the set-builder form:

i) $\{A, P, L, E\}$

ii) $\{5, -5\}$

iii) $\{0\}$

iv) $\{1, 2, 5, 10\}$

v) $\{A, H, J, R, S, T, N\}$

vi) $\{2, 5\}$

a) $\{x: x + 5 = 5, x \in Z\}$

b) $\{x: x \text{ is prime natural number and divisor of } 10\}$

c) $\{x: x \text{ is a letter of the word "RAJASTHAN"}\}$

d) $\{x: x \text{ is a natural number and divisor of } 10\}$

e) $\{x: x^2 - 25 = 0\}$

f) $\{x: x \text{ is a letter of the word "APPLE"}\}$

14. Write the set of all vowels in the English alphabet which precede q .

15. Which of the following sets are empty sets?

a) $A = \{x: x^2 - 3 = 0 \text{ and } x \text{ is rational}\}$

b) $B = \{x: x \text{ is an even prime number}\}$

c) $C = \{x: 4 < x < 5, x \in N\}$

d) $D = \{x: x^2 = 25, \text{ and } x \text{ is an odd integer}\}$

16. Find the pairs of the equal sets, from the following sets, if any, giving reasons:

$A = \{0\}, B = \{x: x > 15 \text{ and } x < 5\}, C = \{x: x - 5 = 0\}, D = \{x: x^2 = 25\}$

and $E = \{x: x \text{ is an integral positive root of the equation } x^2 - 2x - 15 = 0\}$

17. Write power set of the following sets:

a) $A = \{a, b\}$

b) $A = \phi$

c) $A = \{1\}$

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18. Write the following as set-builder form:

- a) $(-2, 0)$
- b) $[1, 3]$
- c) $[2, 3)$
- d) $(5, 7]$

19. Write the following in interval form:

- a) $\{x \in R: -1 \leq x \leq 2\}$
- b) $\{x \in R: 2 \leq x \leq 4\}$

20. 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 second set. Find the values of m and n