doubtnut
India's Number 1 Education App

MATHS

BOOKS - S CHAND MATHS (ENGLISH)

SETS

Example

1. If $A = \{1, 2, 3, 4, 5, 6\}$ and $B = \{2, 4, 5, 6, 8, 9, 10\}$, then $A \Delta B$ is equal to

A. {1,3}

B. {8,9,10}

C. {2,4,5,6}

D. {1,3,8,9,10}

Answer: D

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2. Suppose $A_1, A_2, \ldots\ldots, A_{20}$ are twenty sets each having 5 elemennts and $B_1, B_2, \ldots\ldots\ldots\ldots, B_n$ are n sets each having 2 elements. Let $U_{i=1}^{20} A_i = S = U_{f=1}^{n} B_f$. If each element of S belong to exactly 10 of the $A_i' s$ and to exactly 4 of the $B_i' s$ then n is

(i) 10

(ii) 20

(iii) 100

(iv) 50

A. 10

B. 20

C. 100

D. 50

Answer: B

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3. If $n(\xi) = 50, n((A \cup B)') = 15, n = (A - B) = 12$ and $n(B - A) = 14$, then $n(A \cap B)$ is

A. 9

B. 10

C. 11

D. 12

Answer: A

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4. The set $A \cap (B \cup (B' \cap C) \cup (B' \cap C'))$ is equal to (i) $B \cap C$ (ii) $B \cap C'$ (iii) A (iv) B

A. $B \cap C$

B. $B \cap C'$

C. A

D. B

Answer: C

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Multiple Choice Questions

1. Which of the follwing collection of objects is not a set? (i) The collection of all even integers. (ii) The collection of all months of a year beginning with letter J. (iii) The collection of most talented writers of India. (iv) The collection of all prime numbers less than 20.

A. The collection of all even integers.

B. The collection of all months of a year beginning with letter J.

C. The collectionn of most talented writers of India.

D. The collection of all prome numbers less than 20.

Answer: C

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2. If $A = \{1, 2, 3, 4, 5\}$ then which of the following is not true?

A. $0 \notin A$

B. $3 \in A$

C. $\{3\} \in A$

D. $\{3\} \subset A$

Answer: C

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3. Which of the following is a null set?

A. $\{x : x \in N, 2x - 1 = 3\}$

B. $\{x : \xi nN, x^2 < 20\}$

C. $\{x : x \text{is even prime greater than } 2\}$

D. $x : x \in I, 3x + 7 = 1\}$

Answer: C

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4. Which of the following is a finite set?

(i) $\{x : x = 2n, n \in N\}$

(ii) $\{x : x \text{is a prime number}\}$

(iii) $\{x : x \in N, x \text{is a factor of } 128\}$

(iv) $\{x : x \in I, x \leq 7\}$

A. $\{x : x = 2n, n \in N\}$

B. $\{x : x \text{is a prime number}\}$

C. $\{x : x \in N, x \text{is a factor of } 128\}$

D. $\{x : x \in I, x \leq 7\}$

Answer: C

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5. Given sets $A = \{1, 3, 5, 7, 9\}, B = \{0, 2, 4, 6\}$ and $C = \{7, 8, 9\}$. Which of the following may be taken as universal set for all the three sets A,B and C?

A. A. {0,1,2,3,4,5,6,7,8}

B. B. {1,2,3,4,5,6,7,8,9}

C. C. {1,2,3,4,5,6,7,8,9,10}

D. D. {0,1,2,3,4,5,6,7,8,9,10}

Answer: D

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6. Number of proper subsets of a set containing 4 elements is

(i) 4^2

(ii) $4^2 - 1$

(iii) 2^4

(iv) $2^4 - 1$

A. 4^2

B. $4^2 - 1$

C. 2^4

D. $2^4 - 1$

Answer: D

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7. Which of the following is not correct?

A. $N \subset R$

B. $N \subset Q$

C. $Q \subset R$

D. $N \subset T$

Answer: D

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8. On real axis if $A = [1, 5]$ and $B = [3, 9]$ then A-B is

A. A. $(5, 9)$

B. B. $(1, 3)$

C. C. $[5, 9)$

D. D. $[1, 3)$

Answer: D

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9. If $n(A-B)=10, n(B-A)=23, n(A\cup B)=50$, then $n(A\cap B)$ is

A. 7

B. 17

C. 27

D. 33

Answer: B

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10. Two finite sets A and B are such that $A\subset B$, then which of the following is not correct?

A. a. $A\cup B=B$

B. b. $A\cap B=A$

C. c. $A-B=\phi$

D. d. $B-A=\phi$

Answer: D

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11. Two finite sets have m and n elements respectively. The total number of subsets of the first set is 192 more than the total number of subsets of the second set. The values of m and n respectively are (i) 7,6 (ii) 8,6 (iii) 8,5 (iv) 9,7

A. 7,6

B. 8,6

C. 8,5

D. 9,7

Answer: B

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12. For an two sets A and B, $A \cap (A \cup B)$ is equal to

(i) A

(ii) B

(iii) ϕ

(iv) $A \cap B$

A. A

B. B

C. ϕ

D. $A \cap B$

Answer: A

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13. The symmetric difference of $A = \{0, 1, 2\}$ and $B = \{2, 3, 4\}$ is

A. $\{0, 1\}$

B. $\{3, 4\}$

C. $\{0, 1, 3, 4\}$

D. $\{0, 1, 2, 3, 4\}$

Answer: C

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14. The symmetric difference of sets A and B is equal to

(i) $(A - B) \cup (B - A)$

(ii) $(B - A) \cup B$

(iii) $(A \cup B) - (A \cap B)$

(iv) $(A \cup B) \cap (A \cap B)$

A. $(A - B) \cup (B - A)$

B. $(B - A) \cup B$

C. $(A \cup B) - (A \cap B)$

D. $(A \cup B) \cap (A \cap B)$

Answer: C

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15. The symmetric difference of sets A and B is equal to

A. a. $(A - B) \cap (B - A)$

B. b. $(A - B) \cup (B - A)$

C. c. $(A \cup B) - (A \cap B)$

D. d. $((A \cup B) - B) \cup ((A \cup B) - A)$

Answer: A

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16. For any two sets X and Y, $X \cap (X \cup Y)'$ is equal to

A. X

B. Y

C. ϕ

D. $X \cap Y$

Answer: C

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17. For any two sets A and B, $((A' \cup B') - A)'$ is equal to

A. A

B. B

C. C

D. $A \cap B$

Answer: A

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18. For any two sets A and B $[B' \cup (B'A)]'$ is equal to

A. A

B. B

C. ϕ

D. $A \cup B$

Answer: B

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19. For any three sets A,B, and C, $(A - B) \cap (C - B)$ is equal to (i) $A - (B \cap C)$ (ii) $(A - C) \cap B$ (iii) $(A \cap C) - B$ (iv) $(A - B) \cap C$

A. $A - (B \cap C)$

B. $(A - C) \cap B$

C. $(A \cap C) - B$

D. $(A - B) \cap C$

Answer: C

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20. Let A and B are two disjoint sets and N be the universal set then $A' \cup ((A \cup B) \cap B')$ is equal to

(i) ϕ

(ii) ξ

(iii) A

(iv) B

A. ϕ

B. ξ

C. A

D. B

Answer: B

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21. Let S=Set of points inside the square, T=set of points inside the triangle and C=the set of points inside the circle. If the triangle and circle intersect each other and are contained in a square. Then (i) $S \cap T \cap C = \phi$ (ii) $S \cup T \cup C = C$ (iii) $S \cup T \cup C = S$ (iv) $S \cup T = S \cap C$

A. $S \cap T \cap C = \phi$

B. $S \cup T \cup C = C$

C. $S \cup T \cup C = S$

D. $S \cup T = S \cap C$

Answer: C

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22. Let R be the set of points inside a rectangle of sides a and b $(a, b > 1)$ with two sides along the positive direction of x-axis and y-axis.

Then

(i) $R = \{(x, y) : 0 \leq x \leq a, a \leq y \leq b\}$

(ii) $R = \{(2, y) : 0 \leq x < a, 0 \leq y \leq b\}$

(iii) $R = \{(x, y) : 0 \leq x \leq a, 0 < y < b\}$

(iv) $R' = \{(x, y) : 0 < x < a, 0 < y < b\}$

A. $R = \{(x, y) : 0 \leq x \leq a, a \leq y \leq b\}$

B. $R = \{(2, y) : 0 \leq x < a, 0 \leq y \leq b\}$

C. $R = \{(x, y) : 0 \leq x \leq a, 0 < y < b\}$

D. $R' = \{(x, y) : 0 < x < a, 0 < y < b\}$

Answer: D

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23. In a class of 80 students, 39 students play football and 45 students play cricket and 15 students play both the games. Then the number of students who play neither is

A. (a) 11

B. (b) 14

C. (c) 16

D. (d) 18

Answer: A

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24. In a town of 840 persons, 450 persons read Hindi, 300 read English and 200, read both. The number of persons who read neither is

A. (a) 210

B. (b) 290

C. (c) 180

D. (d) 260

Answer: B

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25. In a group of 70 people, 52 like soft drinks and 37 like tea and each person likes atleast one of the two drinks. Then the number of people who like both the drinks is (i) 15 (ii) 19 (iii) 18 (iv) 20

A. 15

B. 19

C. 18

D. 20

Answer: B

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26. A T.V survey gives the following data for T.V watching 59% of the people of watch program A, 67% of the people watch program B and $x\%$ of the people watch both the program, then

A. x=26

B. x=59

C. $26 \leq x \leq 59$

D. $x \geq 59$

Answer: C

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27. If

$A = \left\{(x, y) : y = \frac{1}{x}, 0 \neq x \in R\right\}, B = \{(x, y) : y = -x, x \in R\}$

then (i) $A \cap B = A$ (ii) $A \cap B = B$ (iii) $A \cap B = \phi$ (iv) $A \cup B = A$

A. $A \cap B = A$

B. $A \cap B = B$

C. $A \cap B = \phi$

D. $A \cup B = A$

Answer: C

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28. If $n(\xi) = 50, n(A) = 38, n(B) = 30$ then the least value of $n(A \cap B)$ is (i) 30 (ii) 38 (iii) 50 (iv) 18

A. 30

B. 38

C. 50

D. 18

Answer: D

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29. Let $x = \{1, 2, 3, \ldots 40\}, A = \{x : x \text{is divisible by } 2 \text{ and } 3\}$ and $B = \{x : x = n^2, x \in N\}$ then $n(A) - n(B)$ is

A. 0

B. 1

C. 2

D. 3

Answer: A

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Exercise 1 A

1. Which of the collections are sets? The collection of all months of a year, beginning with letter J

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2. Let $A = \{1, 2, 3, 4, 5, 6\}$. Insert the appropriate symbol $\in$ or $\notin$ in the blank spaces. 5.....A,

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3. Let $A = \{1, 2, 3, 4, 5, 6\}$. Insert the appropriate symbol $\in$ or $\notin$ in the blank spaces. 8.....A,

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4. Let $A = \{1, 2, 3, 4, 5, 6\}$. Insert the appropriate symbol $\in$ or $\notin$ in the blank spaces. 0.....A,

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5. Let $A = \{1, 2, 3, 4, 5, 6\}$. Insert the appropriate symbol $\in$ or $\notin$ in the blank spaces. 4.....A

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6. Write down a description of each of the following sets. (There could be different suitable descriptions.) $\{2, 4, 6, 8\}$

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7. Write down a description of each of the following sets. (There could be different suitable descriptions.) $\{7, 14, 21, 28, 35\}$

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8. Write down a description of each of the following sets. (There could be different suitable descriptions.) $\{1, 2, 3, 4, 6, 12\}$

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9. List the following sets in roster form. The set of square numbers less than 40.

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10. List the following sets in roster form. The set of colours of the rainbow.

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11. List the following sets in roster form. (a) The set of factors of 144.

(b) The set of prime factors of 144.

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12. List the following sets in roster form. The set of natural numbers less than 50.

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13. List the following sets in roster form. The set of consonants before i in the English alphabet.

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14. List the following sets in roster form. The set of letters in the work 'Satellite'

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15. Rewrite the following sets in the indicated notation. $\{-2, -4, -6, -8\}$, (a) Words (b) Set-builder notation

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16. Rewrite the following sets in the indicated notation. Positive multiples of 11 Roster form

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17. Rewrite the following sets in the indicated notation. $\{-9, -7, -5, -3, -1\}$, Set-buider notation

View Text Solution

18. Rewrite the following sets in the indicated notation. Even numbers between 27 and 39 (a) Roster form (b) Set-builder notation

View Text Solution

19. Rewrite the following sets in the indicated notation. $\{x \mid 0 < x < 1\}$, (a) Words (b) Roster form

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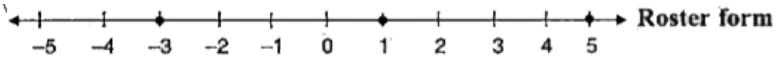
20. Rewrite the following sets in the indicated notation.



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21. Rewrite the following sets in the indicated notation. Negative multiples of 3

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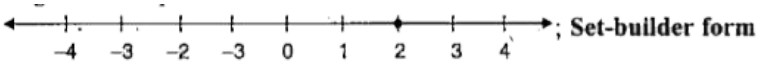
22. Rewrite the following sets in the indicated notation.



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23. Rewrite the following sets in the indicated notation. Numbers more than 2 units from 8, Set-builder form.

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24. Rewrite the following sets in the indicated notation. $x \neq 5$ and $x \leq 10$, Set-builder form.

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25. Rewrite the following sets in the indicated notation. $\{y \mid y = 5x - 2, y \in N\}$: Roster form

View Text Solution

26. Rewrite the following sets in the indicated notation. $\left\{x \mid x = \frac{3p+1}{2p-1}, p \in W \text{ and } p \leq 5\right\}$, Roster form

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27. State whether each of the following sets is finite or infinite : The set of lines which are parallel to the x-axis.

View Text Solution

28. State whether each of the following sets is finite or infinite : The set of letters in the English aplhabet.

View Text Solution

29. State whether each of the following sets is finite or infinite : The set of numbers which are multiple of 5.

View Text Solution

30. State whether each of the following sets is finite or infinite : The set of animals living on earth.

View Text Solution

31. State whether each of the following sets is finite or infinite : The set of circles through the origin (0,0).

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32. State whether each of the following sets is finite or infinite : The set of whole numbers greater than 5.

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33. State whether each of the following sets is finite or infinite : The set of natural numbers less than one billion.

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34. State whether each of the following sets is finite or infinite : The sef of integers between -4 and 4.

View Text Solution

35. State whether each of the following sets is finite or infinite : The set of rational numbers between 0 and 1.

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36. Which of the following sets are empty sets? $A = \{x : x \text{ is a human being living on Mars}\}$

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37. Are the following sets equal? Give reasons. $A = \{2, 3\}, B = \{x : x \text{ is solution of } x^2 + 5x + 6 = 0\}$

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38. Are the following sets equal? Give reasons.

$A = \{x : x \text{is a letter in the word FOLLOW}\}$

$B = \{y : y \text{ is a letter in the word WOLF}\}$

View Text Solution

39. Which of the following are singleton sets? $A = \{x : |x| = 5, x \in N\}$

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40. State the value of n(A) for each of the following sets.

$A = \{\text{Months of the year}\}$

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41. State the value of n(A) for each of the following sets.

$A = \{\text{Planets of our solar system}\}$

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42. State the value of n(A) for each of the following sets.

$A = \{x : x \text{ is an integer and } -8 \leq x \leq 3\}$

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43. State the value of n(A) for each of the following sets.

$A = \{x : x \text{ is an even number}\}$

View Text Solution

44. Use interval notation to represent each set of numbers.

$-17 < x < 0$

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45. Use interval notation to represent each set of numbers. $6 \leq x \leq 12$

View Text Solution

46. Use interval notation to represent each set of numbers. $-1 < x \leq 4$

View Text Solution

47. Use interval notation to represent each set of numbers. $-4 \leq x < 7$

View Text Solution

48. Use interval notation to represent each set of numbers. $x \leq 3 \text{ or } 5 < x \leq 9$

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49. Use interval notation to represent each set of numbers. $\{x \mid x \geq 99\}$

View Text Solution

50. Use interval notation to represent each set of numbers. $\{x \mid x \geq 1\}$

View Text Solution

51. Use interval notation to represent each set of numbers. $\{1, 3, 5, 7, \ldots\ldots\}$

View Text Solution

52. Use interval notation to represent each set of numbers. $x \neq 3$

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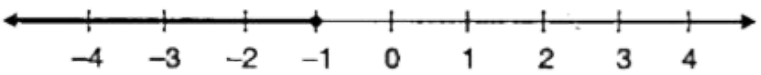
53. Use interval notation to represent each set of numbers.



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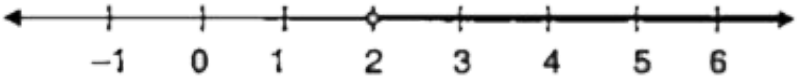
54. Use interval notation to represent each set of numbers.



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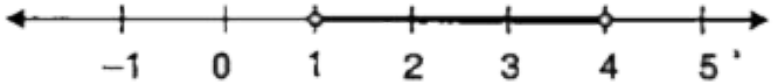
55. Use interval notation to represent each set of numbers.



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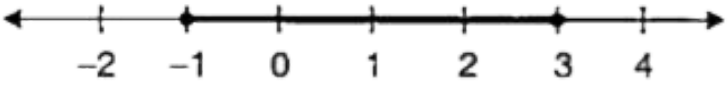
56. Use interval notation to represent each set of numbers.



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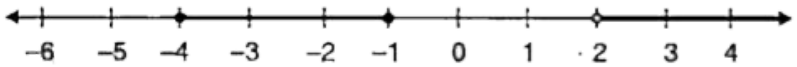
57. Use interval notation to represent each set of numbers.



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Exercise 1 B

1. Find the subsets of (i) $\{a\}$ (ii) $\{\text{Reena, Sonu}\}$ (iii) ϕ (iv) $\{5, \{7\}\}$

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2. Let $A = \{p, q, r\}$ List all the subsets of A.

View Text Solution

3. Let $A = \{p, q, r\}$ List all the proper subsets of A.

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4. Let P $P = \{\text{whole numbres less than } 30\}$ Let the subset Q $\{\text{even numbers}\}$

View Text Solution

5. Let P $P = \{\text{whole numbres less than } 30\}$ List the subset R $\{\text{odd numbers}\}$

View Text Solution

6. Let P $P = \{\text{whole numbres less than } 30\}$ List the subset S $\{\text{prime numbers}\}$

View Text Solution

7. Let P $P = \{\text{whole numbres less than } 30\}$ List the subset List the subset T $\{\text{square numbers}\}$

View Text Solution

8. Let P $P = \{\text{whole numbres less than } 30\}$ U $\{\text{trangle numbers}\}$

View Text Solution

9. Tell in each of the following, whether first set is a subset of the second set or not. A= Set of letters in the word 'LATE'

B= Set of letters in the word 'PLATE'

View Text Solution

10. Tell in each of the following, whether first set is a subset of the second set or not. P= Set of even prime numbers.

$Q = \{x \mid x = 2p, p \in N \text{ and } 1 \leq p \leq 3\}$

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11. Tell in each of the following, whether first set is a subset of the second set or not. L= Set of digits in the number 1590

M=Set of digits in the number 178902

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12. Tell in each of the following, whether first set is a subset of the second set or not. E= Set of all triangles having 4 sides.

F= Set of digits in the number '100'

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13. Write the proper subsets of the following sets: $\{7\}$

View Text Solution

14. Write the proper subsets of the following sets: $\{1, 3\}$

View Text Solution

15. Write the proper subsets of the following sets: $\{c, a, b\}$

View Text Solution

16. Write the proper subsets of the following sets: ϕ

View Text Solution

17. How many subsets do the following sets have ? A set having 5 elements

View Text Solution

18. How many subsets do the following sets have ? The set of letters of the word 'CENTENARY'

View Text Solution

19. How many proper subsets do the following sets have? The set of factors of 12.

View Text Solution

20. How many proper subsets do the following sets have? The set $A\{x \mid x \text{ is a prime number } x < 20\}$

View Text Solution

21. Answer true of false $\{3\} \subseteq \{3, 0\}$

View Text Solution

22. Answer true of false $0 \in \{3, 0\}$

View Text Solution

23. Answer true of false $\phi \subset \{\phi\}$

View Text Solution

24. Answer true of false Every subset of a finite set is finite.

View Text Solution

25. Find the power set of each of the following sets : $A = \{\text{digits in the number } 98\}$

View Text Solution

26. Find the power set of each of the following sets : $B = \{\text{letters in the word 'KID'}\}$

View Text Solution

27. Find the power set of each of the following sets : $S = \{2, 3\}$

View Text Solution

28. Find the power set of each of the following sets : $T = \{4, 7, 9\}$

View Text Solution

Exercise 1 C

1. Suggest a universal set for each of the following: {Jaipur, Chennai, Bangalore, Itanagar}

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2. Suggest a universal set for each of the following: {Narmada, Cauvery, Mahanadi,Jhelum}

View Text Solution

3. Suggest a universal set for each of the following: {Asia,Europe,Antarctica}

View Text Solution

4. Suggest a universal set for each of the following: $\{\text{Earth, Mars, Venus}\}$

View Text Solution

5. Suggest a universal set for each of the following: $\{0, 5, 10, 15, 20, 25\}$

View Text Solution

6. What universal set may be proposed for the following sets? The set of parallelograms

View Text Solution

7. What universal set may be proposed for the following sets? The set of irrational numbers

View Text Solution

8. What universal set may be proposed for the following sets? The set of positive even numbers

View Text Solution

9. Solve the following equations : $\{x \mid 2x + 6 = 0, x \in Z\}$

View Text Solution

10. Solve the following equations : $\{x \mid 5x + 16 = 1, x \in N\}$

View Text Solution

11. Solve the following equations : $\{x \mid 2x - 3 < 7, x \in W\}$

View Text Solution

12. Solve the following equations : $\{x \mid 4x - 25 > 13, x \in Z\}$

View Text Solution

13. Solve the following equations :

$$\left\{y \mid \frac{5y}{3} - 7 \leq 13, \quad \text{y is a prime number}\right\}$$

View Text Solution

14. $\xi = \left\{-2\frac{1}{2}, -1, \sqrt{2}, 3.5, \sqrt{30}, \sqrt{36}\right\}$

$X = \{\text{integers}\}, Y = \{\text{irrational numbers}\}$

List the members of (i) X (ii) Y

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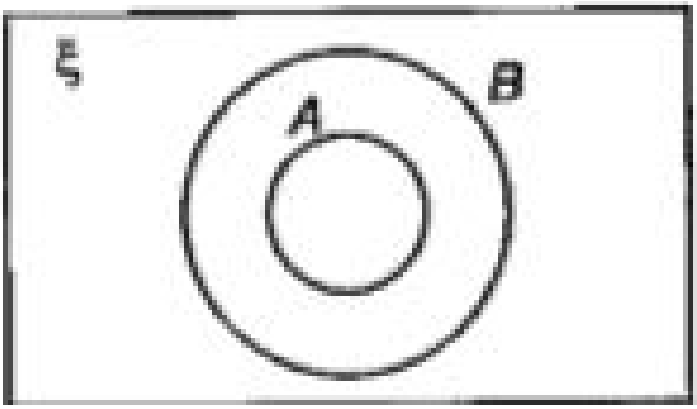
15. $\xi = \{40, 41, 42, 43, 44, 45, 46, 47, 48, 49\}$

$A = \{\text{prime numbers}\}, B = \{\text{odd numbers}\}$

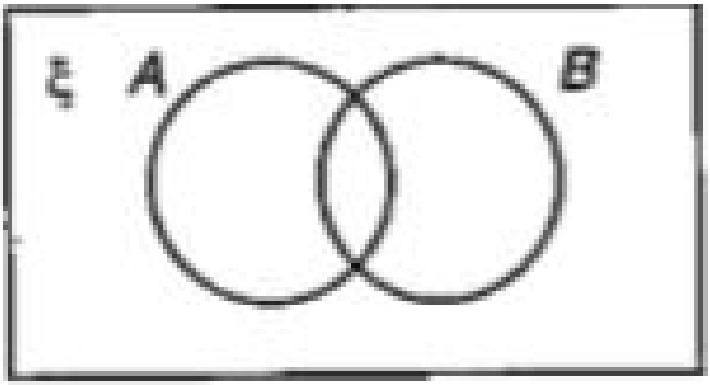
(i) Place the ten numbers in the correct places on the diagram.

(ii) Write the set $B \cap A'$



View Text Solution

16. Shade the regions as directed? $A \cap B$

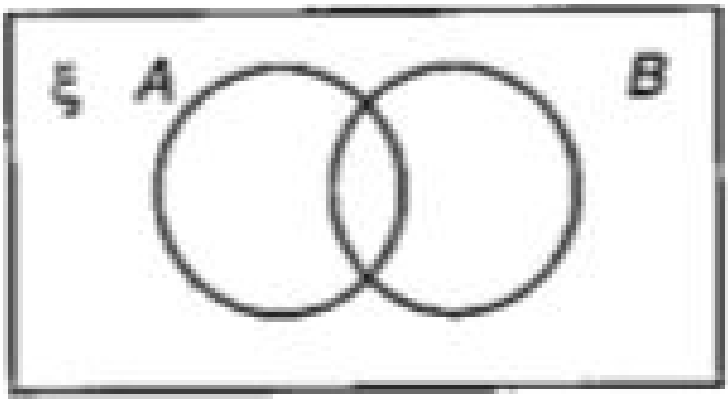


(i)

View Text Solution

View Text Solution

17. Shade the regions as directed? $(A \cup B)'$



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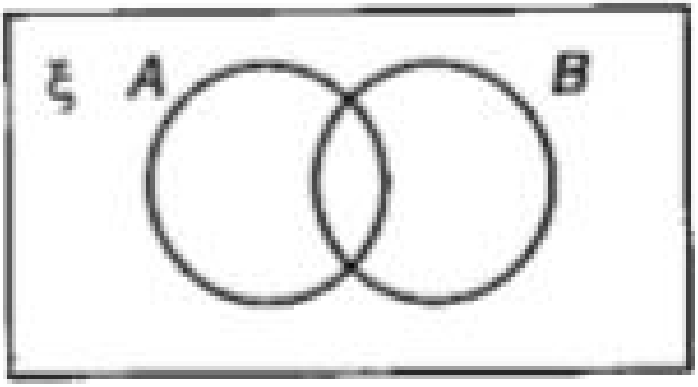
18. Shade the regions as directed? Complementary set B



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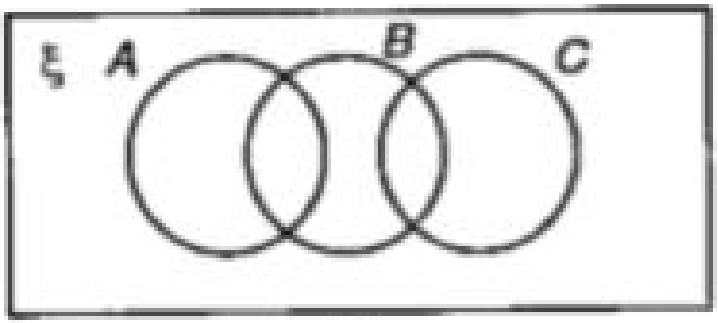
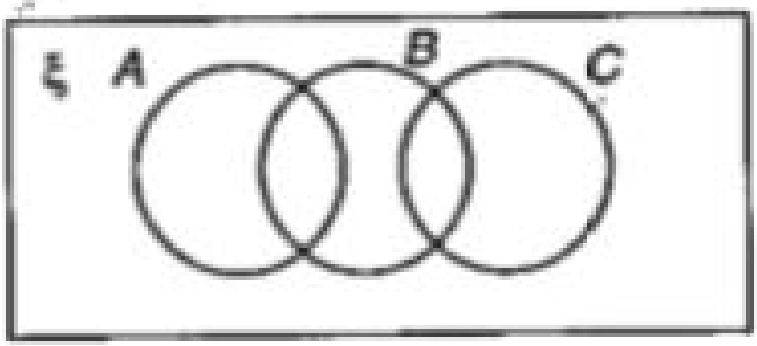
19. On the Venn diagrams shade the regions : $A' \cap C$



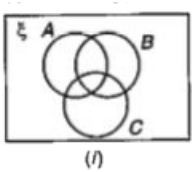
View Text Solution

20. On the Venn diagrams shade the regions : $(A \cup C) \cap B$

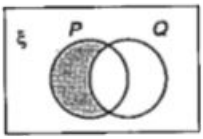


View Text Solution

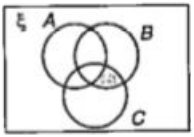
21. On a copy of the Venn diagram, shade the set $A \cup (B \cap C)$



(i)



(ii)



(iii)

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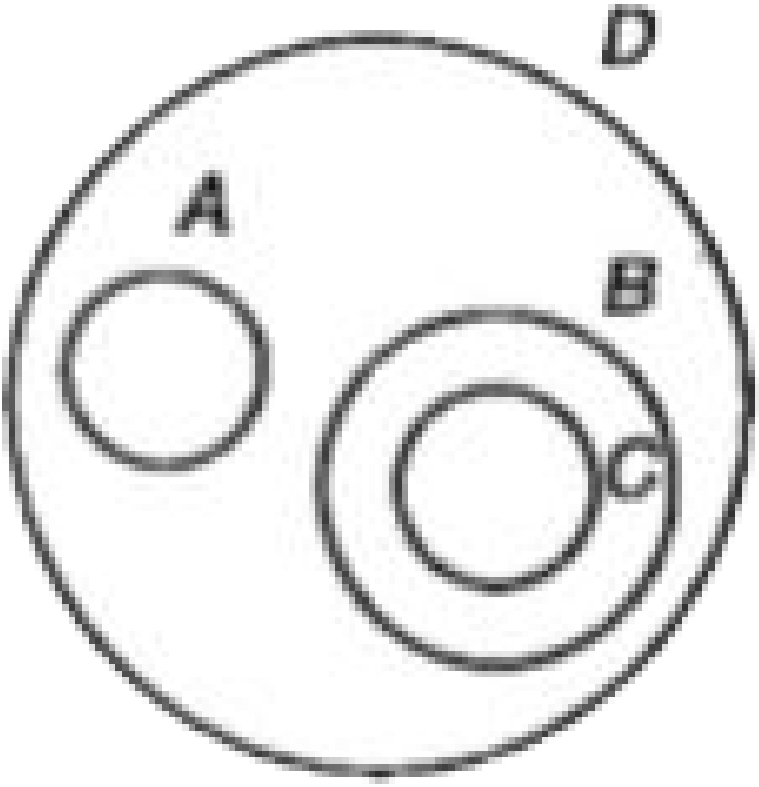
22. Express in set notation the subset shaded in the Venn diagram.

View Text Solution

23. Express in set notation as simply as possible, the subset shaded in the Venn diagram.

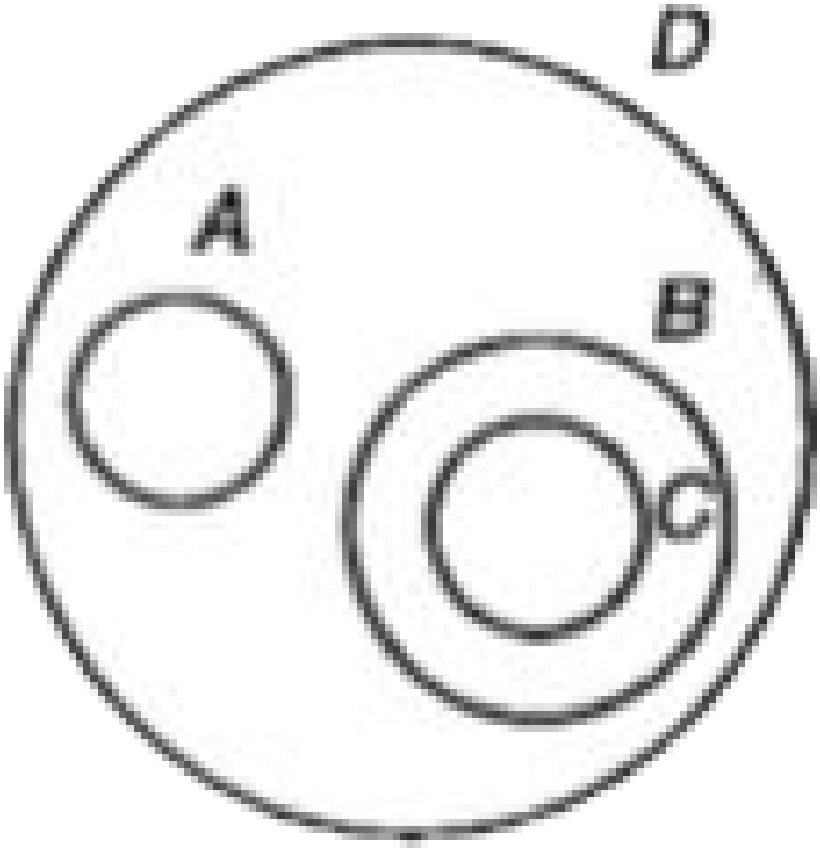
View Text Solution

24. Answer true or false. Refer to the adjoining figure. $A \subset D$



View Text Solution

25. Answer true or false. Refer to the adjoining figure. $A \not\subset B$



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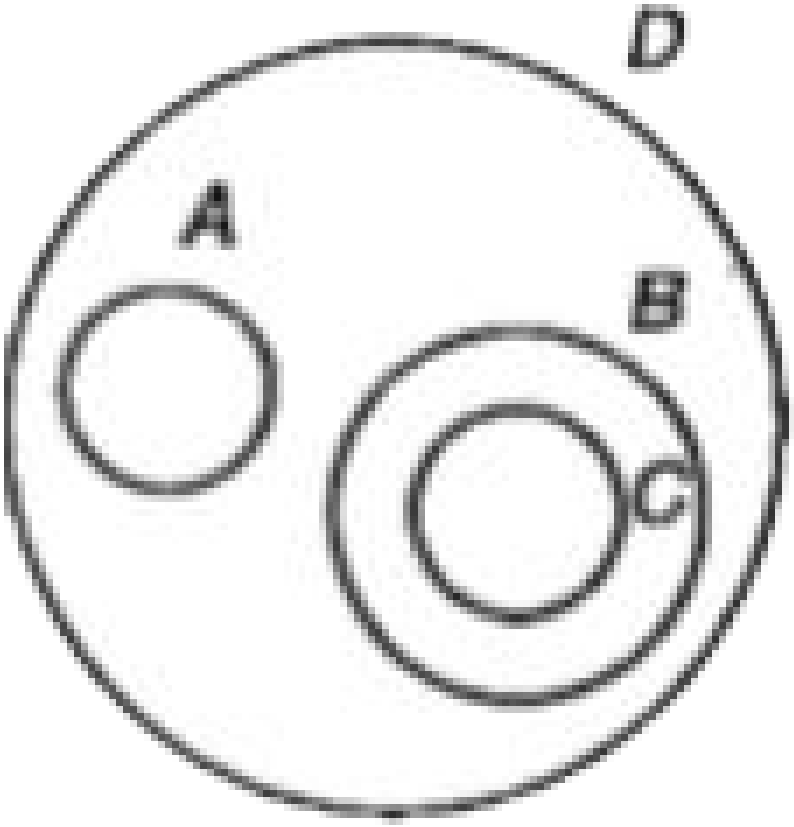
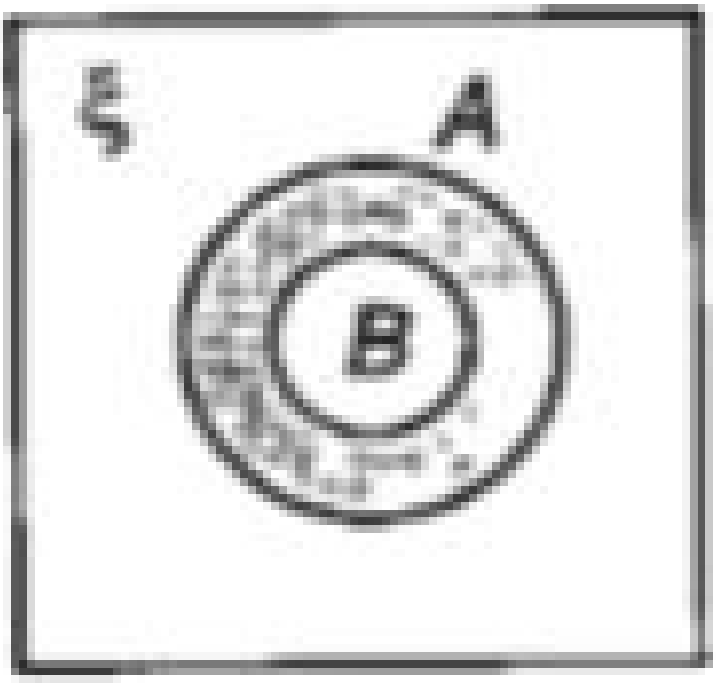
26. Answer true or false. Refer to the adjoining figure. $C \subset D$



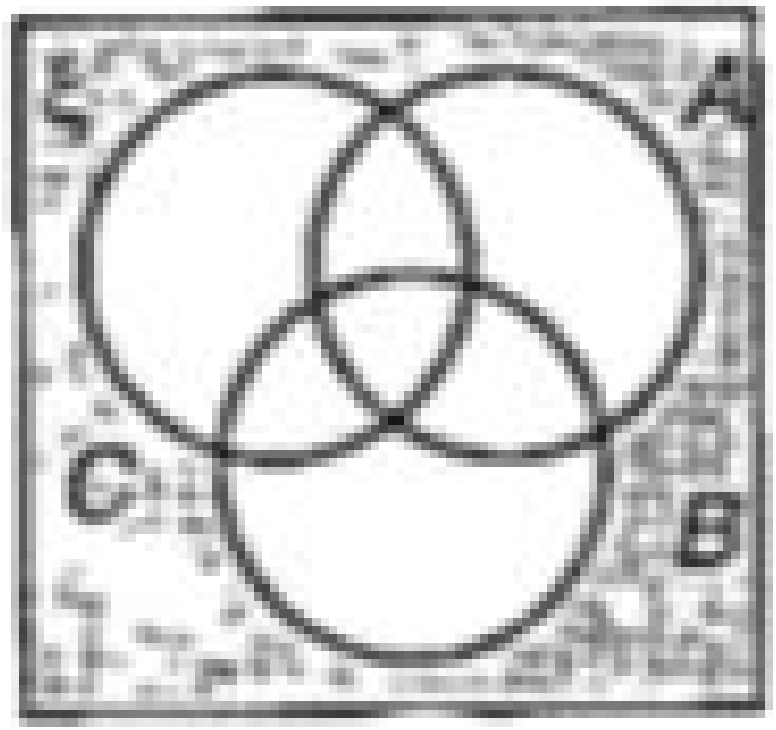
View Text Solution

27. Describe the shaded areas in the following Venn diagrams.



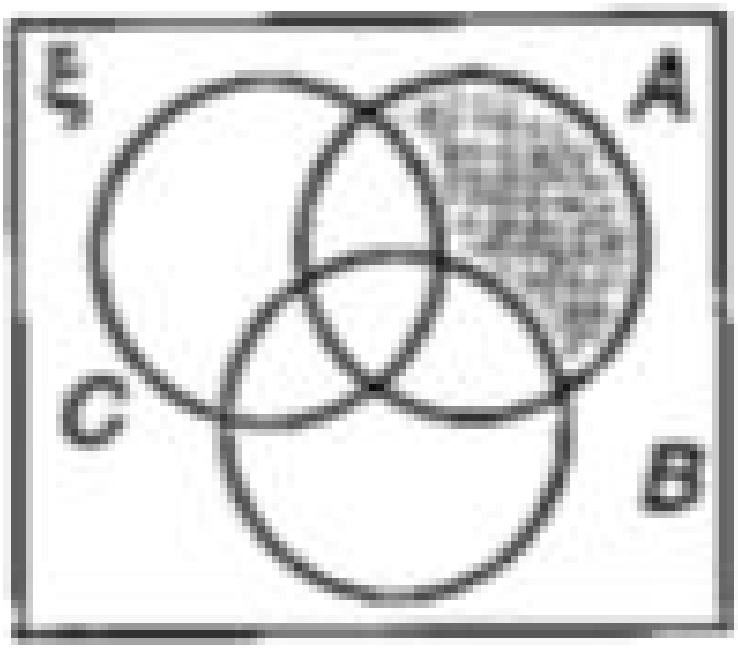
View Text Solution

28. Describe the shaded areas in the following Venn diagrams.



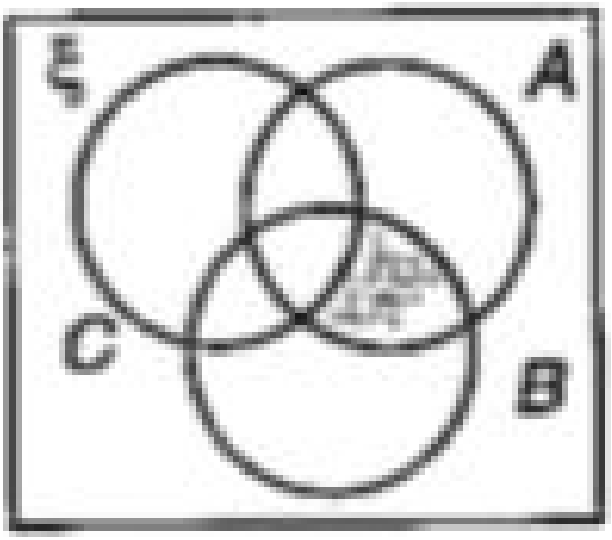
View Text Solution

29. Describe the shaded areas in the following Venn diagrams.



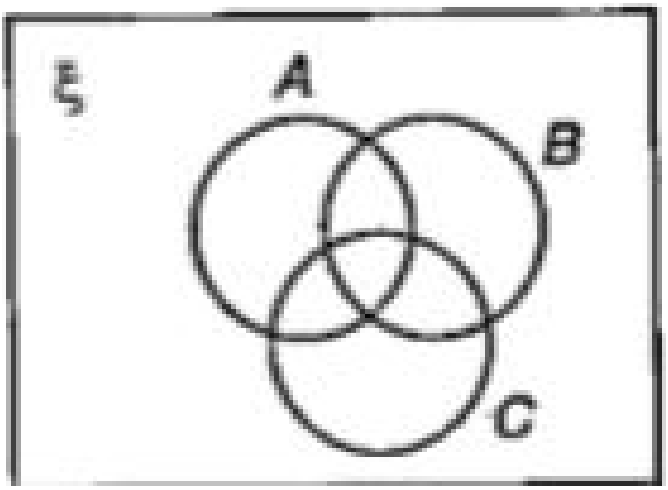
View Text Solution

30. Describe the shaded areas in the following Venn diagrams.



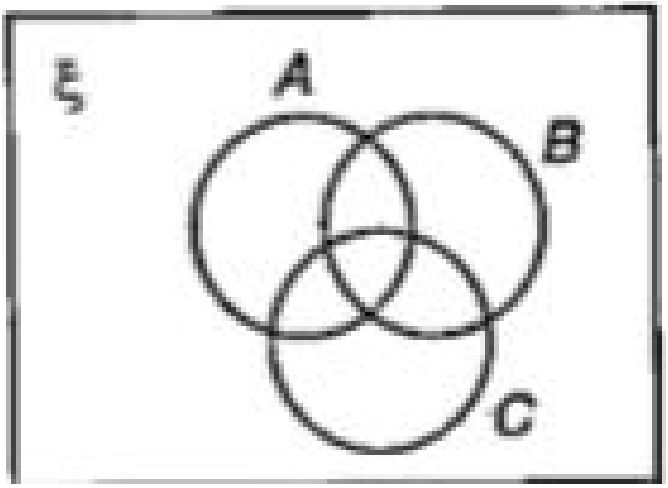
View Text Solution

31. Use the given diagram to shade the following regions. $A' \cap B \cap C$



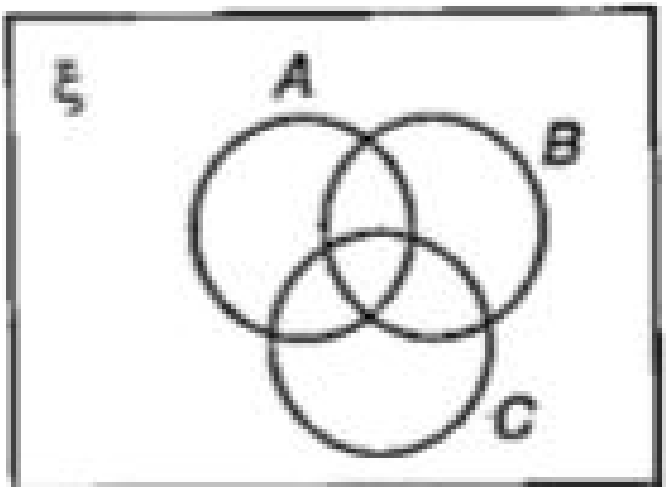
View Text Solution

32. Use the given diagram to shade the following regions. $A' \cap B \cap C'$



View Text Solution

33. Use the given diagram to shade the following regions. $(A \cap B \cap C)'$



View Text Solution

34.

$X = \{\text{all triangles}\}$, $P = \{\text{isosceles triangles}\}$, $Z = \{\text{equilateral triangles}\}$

, Draw a Venn diagram to illustrate the relationship between these sets.

View Text Solution

35. Draw a Venn diagram to show the relationship between the following sets :

$\xi = \{\text{quadrilaterals}\}, A = \{\text{parallelgrams}\}, B = \{\text{rectangles}\}, C = \{\text{rhom}$

Show in your diagram the region that represents the set of squares.

View Text Solution

36. Using $\xi = \{\text{books}\}, N = \{\text{novles}\}$ and $D = \{\text{detective novels}\}$, represent the following statement as a Venn diagram, Some novels are not detective novels'

View Text Solution

37. Illustrate by a Venn diagram the relationship between the sets A, B and C given that $B \subset A, C \subset B'$ and $A \cap C = \phi$.

View Text Solution

38. If

$\xi = \{1, 2, 3, 4, 5, 6, 7, 8, 9, 10\}$, $A = \{1, 3, 6, 10\}$, $B = \{1, 3, 5, 7, 9\}$

and $C = \{1, 4, 9\}$ then list the elements of the following sets. $A \cap B$

View Text Solution

39. If

$\xi = \{1, 2, 3, 4, 5, 6, 7, 8, 9, 10\}$, $A = \{1, 3, 6, 10\}$, $B = \{1, 3, 5, 7, 9\}$

and $C = \{1, 4, 9\}$ then list the elements of the following sets. $B \cup C$

View Text Solution

40. If

$\xi = \{1, 2, 3, 4, 5, 6, 7, 8, 9, 10\}$, $A = \{1, 3, 6, 10\}$, $B = \{1, 3, 5, 7, 9\}$

and $C = \{1, 4, 9\}$ then list the elements of the following sets. C'

View Text Solution

41. If

$\xi = \{1, 2, 3, 4, 5, 6, 7, 8, 9, 10\}$, $A = \{1, 3, 6, 10\}$, $B = \{1, 3, 5, 7, 9\}$

and $C = \{1, 4, 9\}$ then list the elements of the following sets. $n(B)$

View Text Solution

42. If

$\xi = \{1, 2, 3, 4, 5, 6, 7, 8, 9, 10\}$, $A = \{1, 3, 6, 10\}$, $B = \{1, 3, 5, 7, 9\}$

and $C = \{1, 4, 9\}$ then list the elements of the following sets. $B \cap C$

View Text Solution

43. If

$\xi = \{1, 2, 3, 4, 5, 6, 7, 8, 9, 10\}$, $A = \{1, 3, 6, 10\}$, $B = \{1, 3, 5, 7, 9\}$

and $C = \{1, 4, 9\}$ then list the elements of the following sets. $A \cap B$

View Text Solution

44. If

$\xi = \{1, 2, 3, 4, 5, 6, 7, 8, 9, 10\}, A = \{1, 3, 6, 10\}, B = \{1, 3, 5, 7, 9\}$

and $C = \{1, 4, 9\}$ then list the elements of the following sets. $A \cup C$

View Text Solution

45. If

$\xi = \{1, 2, 3, 4, 5, 6, 7, 8, 9, 10\}, A = \{1, 3, 6, 10\}, B = \{1, 3, 5, 7, 9\}$

and $C = \{1, 4, 9\}$ then list the elements of the following sets. $A \cup B \cup C$

View Text Solution

46. If

$\xi = \{1, 2, 3, 4, 5, 6, 7, 8, 9, 10\}, A = \{1, 3, 6, 10\}, B = \{1, 3, 5, 7, 9\}$

and $C = \{1, 4, 9\}$ then list the elements of the following sets. $(A \cap B)'$

View Text Solution

47. If

$\xi = \{1, 2, 3, 4, 5, 6, 7, 8, 9, 10\}, A = \{1, 3, 6, 10\}, B = \{1, 3, 5, 7, 9\}$

and $C = \{1, 4, 9\}$ then list the elements of the following sets. A-B

View Text Solution

48. If

$\xi = \{1, 2, 3, 4, 5, 6, 7, 8, 9, 10\}, A = \{1, 3, 6, 10\}, B = \{1, 3, 5, 7, 9\}$

and $C = \{1, 4, 9\}$ then list the elements of the following sets. B-A

View Text Solution

49. If

$\xi = \{1, 2, 3, 4, 5, 6, 7, 8, 9, 10\}, A = \{1, 3, 6, 10\}, B = \{1, 3, 5, 7, 9\}$

and $C = \{1, 4, 9\}$ then list the elements of the following sets. $(A \cup B \cup C)'$

View Text Solution

50. If $\xi = \{1, 2, 3, 4, 5, 6, 7, 8, 9, 10\}, A = \{1, 3, 6, 10\}, B = \{1, 3, 5, 7, 9\}$ and $C = \{1, 4, 9\}$ then list the elements of the following sets. $(A \cap B \cap C)'$

View Text Solution

51. If $\xi = \{1, 2, 3, 4, 5, 6, 7, 8, 9, 10\}, A = \{1, 3, 6, 10\}, B = \{1, 3, 5, 7, 9\}$ and $C = \{1, 4, 9\}$ then list the elements of the following sets. $A \Delta B$

View Text Solution

52. Let $L = \{\text{letters of CRICKET}\}, M = \{\text{letters of CATERPILLAR}\}$ and $N =$ find:

$L \cup M$

View Text Solution

View Text Solution

53. Let

$L = \{\text{letters of CRICKET}\}, M = \{\text{letters of CATERPILLAR}\}$ and $N =$

find:

$M \cup N$

View Text Solution

54. Let

$L = \{\text{letters of CRICKET}\}, M = \{\text{letters of CATERPILLAR}\}$ and $N =$

find:

$L \cup N$

View Text Solution

55. Taking the set of natural numbers as the universal set write down the complements of the following sets: $\{x : x \text{ is a positive multiple of } 3\}$

View Text Solution

56. Taking the set of natural numbers as the universal set write down the complements of the following sets: $\{x : x \text{ is a prime number}\}$

View Text Solution

57. Taking the set of natural numbers as the universal set write down the complements of the following sets: $\{x : x \text{ is a natural number divisible by 3 and 5}\}$

View Text Solution

58. Taking the set of natural numbers as the universal set write down the complements of the following sets: $\{x : x + 5 = 8\}$

View Text Solution

59. Taking the set of natural numbers as the universal set write down the complements of the following sets: $\{x : 2x + 5 = 9\}$

View Text Solution

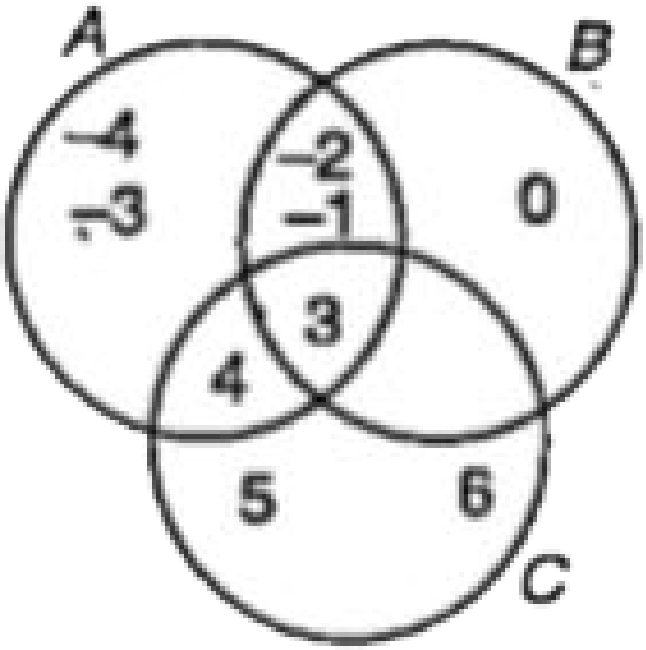
60. Taking the set of natural numbers as the universal set write down the complements of the following sets: $\{x : x \geq 7\}$

View Text Solution

61. Taking the set of natural numbers as the universal set write down the complements of the following sets: $\{x : x \in N \text{ and } 2x + 1 > 10\}$

View Text Solution

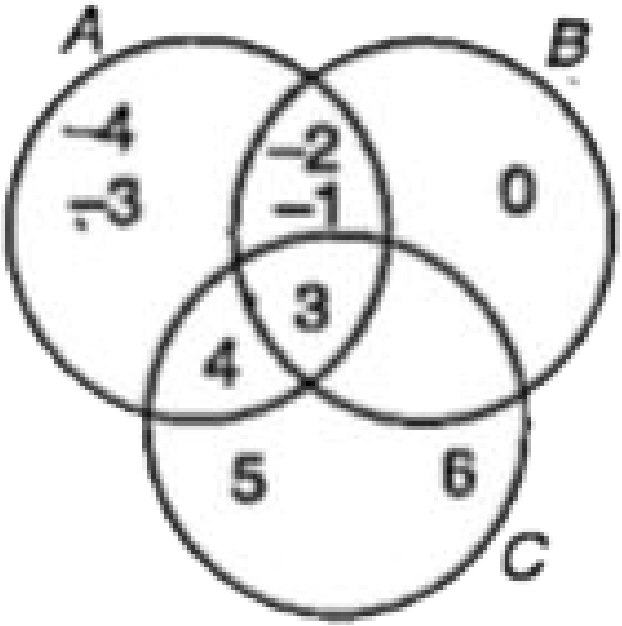
62. Refer to the Venn diagram. List the elements of the following sets. $(A \cap B) \cup C$



View Text Solution

63. Refer to the Venn diagram. List the elements of the following sets.

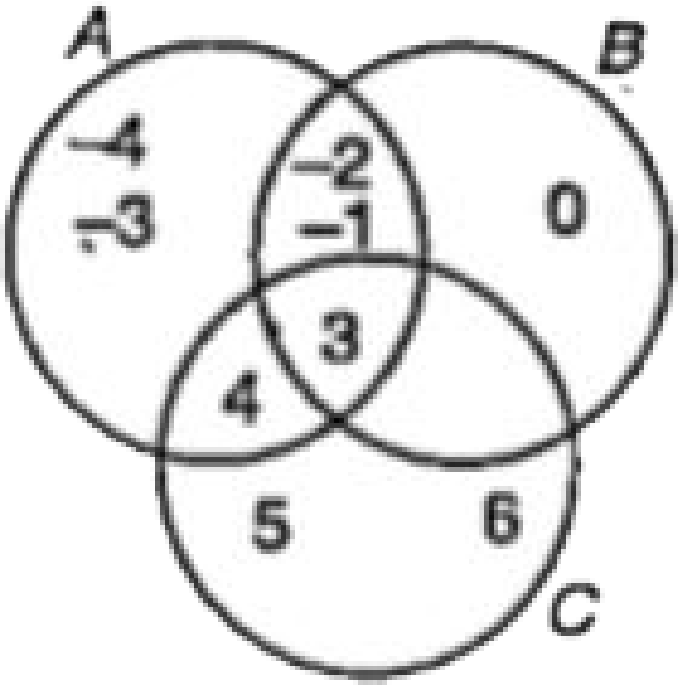
$A \cap (B \cup C)$



View Text Solution

64. Refer to the Venn diagram. List the elements of the following sets.

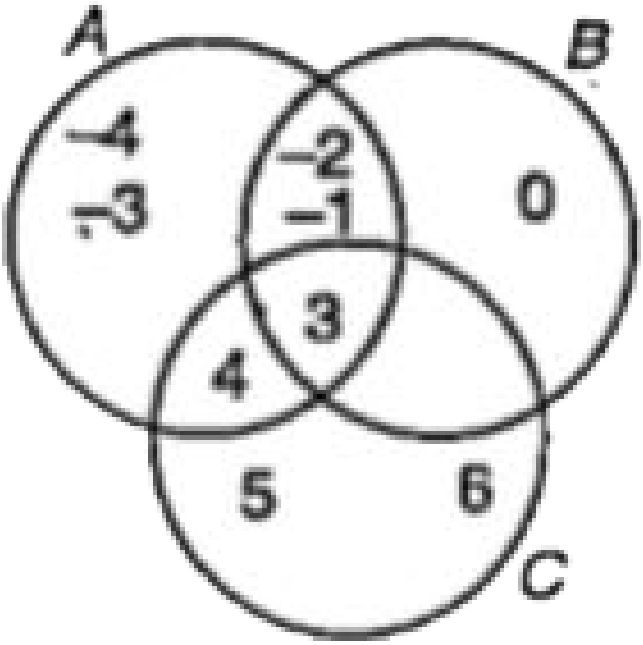
$(A \cap C) \cap (B \cap C)$



View Text Solution

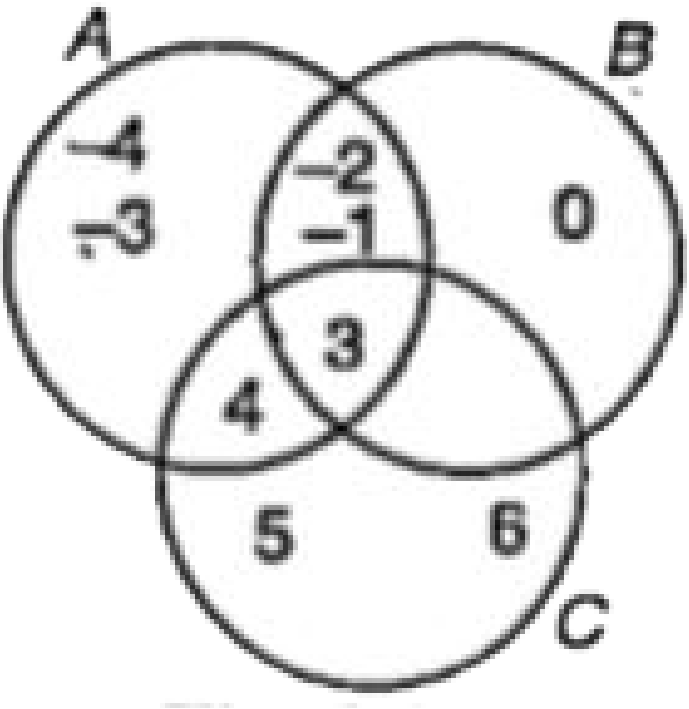
65. Refer to the Venn diagram. List the elements of the following sets.

$(A \cup B) \cap (B \cap C)$



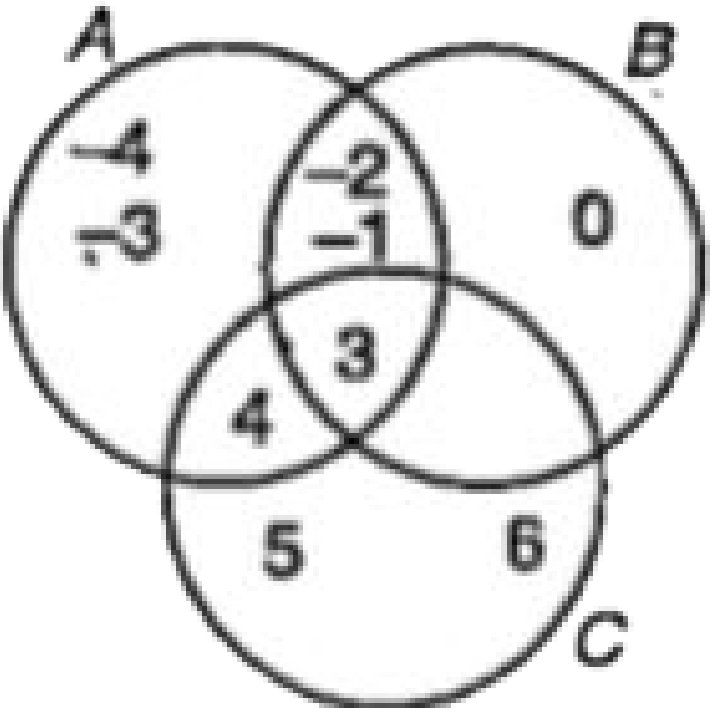
View Text Solution

66. Refer to the Venn diagram. List the elements of the following sets. B-C



View Text Solution

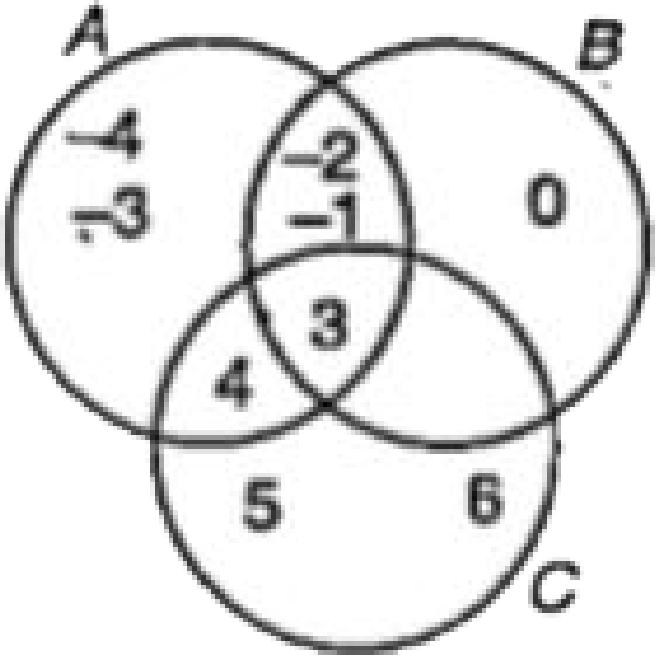
67. Refer to the Venn diagram. List the elements of the following sets. C-B



View Text Solution

68. Refer to the Venn diagram. List the elements of the following sets.

$B \Delta C$



View Text Solution

69. If $x = \{1, 2, 3, 4\}, A = \{1, 4\}, B = \{1, 3\}$, then list the elements of

(i) A' (ii) B' (iii) $(A \cap B)'$ (iv) $(A \cup B)'$ (v) $A' \cap B'(f)A' \cup B'$

Also show that $(A \cup B)' = A' \cup B'$ and $(A \cup B)' = A' \cap B'$

View Text Solution

Exercise 1 D

1. If $n(\xi) = 80, n(A) = 48, n(B) = 40$ and $n(A \cap B) = 25$, draw a Venn diagram to find: $n(A \cup B)$

View Text Solution

2. If $n(\xi) = 80, n(A) = 48, n(B) = 40$ and $n(A \cap B) = 25$, draw a Venn diagram to find: $n(A \cup B)'$

View Text Solution

3. If $n(\xi) = 80, n(A) = 48, n(B) = 40$ and $n(A \cap B) = 25$, draw a Venn diagram to find: $n(A - B$

View Text Solution

4. If $n(\xi) = 80, n(A) = 48, n(B) = 40$ and $n(A \cap B) = 25$, draw a Venn diagram to find: $n(B - A)$

View Text Solution

5. If $n(\xi) = 80, n(A) = 48, n(B) = 40$ and $n(A \cap B) = 25$, draw a Venn diagram to find: $n(A \cap B')$

View Text Solution

6. If $n(\xi) = 80, n(A) = 48, n(B) = 40$ and $n(A \cap B) = 25$, draw a Venn diagram to find: $n(A' \cap B)$

View Text Solution

7. If $\xi = \{x \mid x \in N, x < 10\}$,

$A = \{x \mid x \text{ is a prime number}, x < 10\}, B = \{x \mid x \text{ is an even number}, x$

draw a Venn diagram to find: $n(A \cup B)$

View Text Solution

8. If $\xi = \{x \mid x \in N, x < 10\}$,

$A = \{x \mid x \text{ is a prime number}, x < 10\}, B = \{x \mid x \text{ is an even number}, x$

draw a Venn diagram to find: $n(A \cap B)$

View Text Solution

9. If $\xi = \{x \mid x \in N, x < 10\}$,

$A = \{x \mid x \text{ is a prime number}, x < 10\}, B = \{x \mid x \text{ is an even number}, x$

draw a Venn diagram to find: $n(A \cup B)'$

View Text Solution

10. If $\xi = \{x \mid x \in N, x < 10\}$,

$A = \{x \mid x \text{ is a prime number}, x < 10\}, B = \{x \mid x \text{ is an even number}, x$

draw a Venn diagram to find: $n(A \cap B')$

View Text Solution

11. If $\xi = \{x \mid x \in N, x < 10\}$,

$A = \{x \mid x \text{ is a prime number}, x < 10\}, B = \{x \mid x \text{ is an even number}, x$

draw a Venn diagram to find: $n(A' \cap B)$

View Text Solution

12. Given $n(\xi) = 40, n(A') = 12, n(B) = 15$ and $B \subset A$. Draw a Venn diagram to illustrate this information. Hence find n(A-B).

View Text Solution

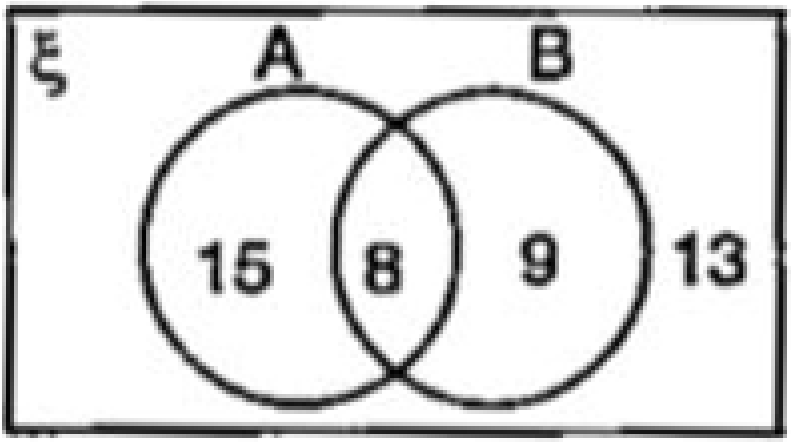
13. The Venn diagram shows:

$\xi = \{\text{pupils in class } 8\}$

$A = \{\text{pupils who play cricket}\}$

$B = \{\text{pupils who play basketball}\}$

How many papils: are in class 8?



View Text Solution

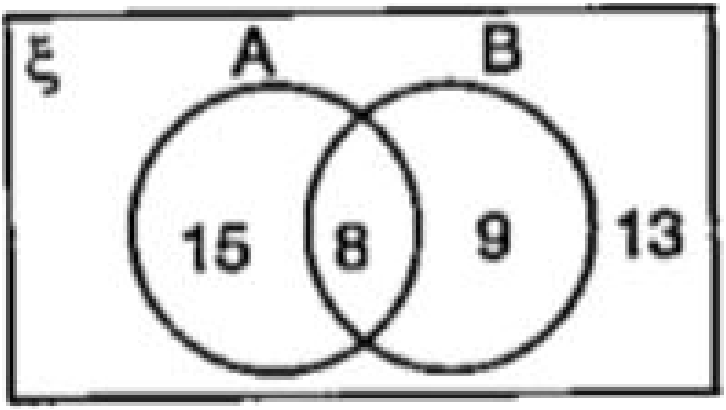
14. The Venn diagram shows:

$\xi = \{\text{pupils in class } 8\}$

$A = \{\text{pupils who play cricket}\}$

$B = \{\text{pupils who play basketball}\}$

How many papils: play cricket



View Text Solution

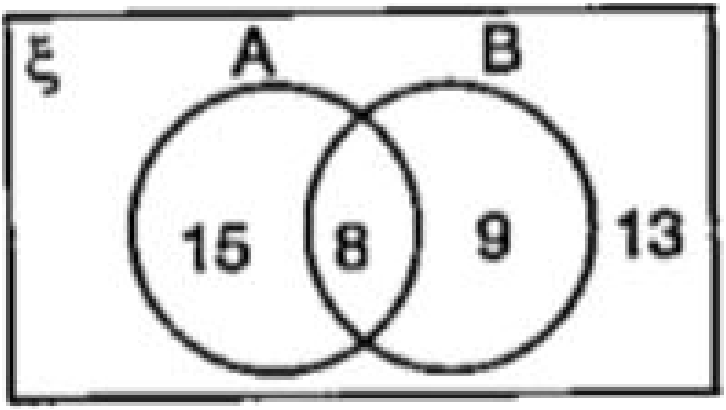
15. The Venn diagram shows:

$\xi = \{\text{pupils in class } 8\}$

$A = \{\text{pupils who play cricket}\}$

$B = \{\text{pupils who play basketball}\}$

How many papils:



View Text Solution

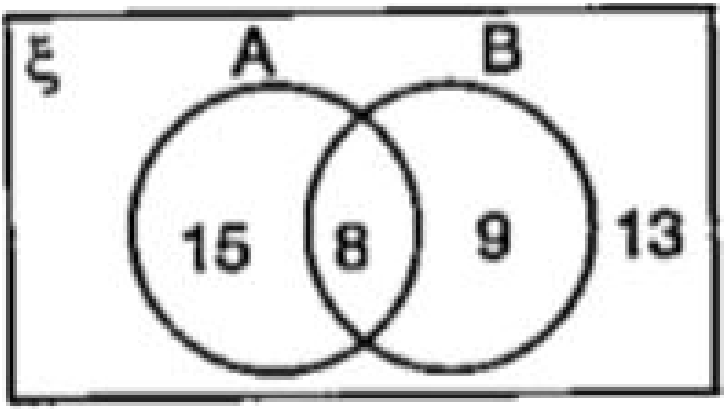
16. The Venn diagram shows:

$\xi = \{\text{pupils in class } 8\}$

$A = \{\text{pupils who play cricket}\}$

$B = \{\text{pupils who play basketball}\}$

How many papils: play both cricket and basketball



View Text Solution

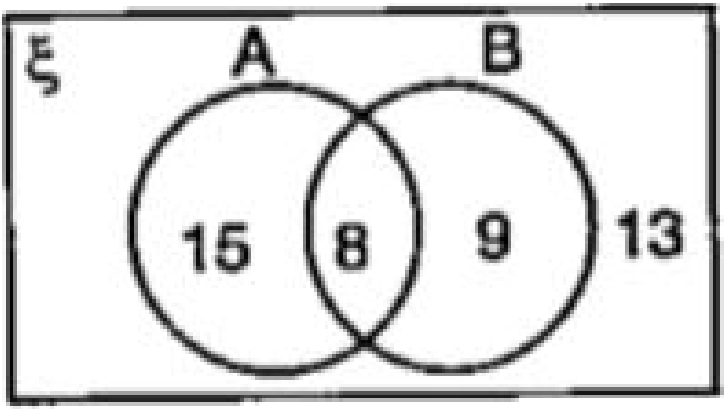
17. The Venn diagram shows:

$\xi = \{\text{pupils in class } 8\}$

$A = \{\text{pupils who play cricket}\}$

$B = \{\text{pupils who play basketball}\}$

How many papils: play neither cricket nor basketball?



View Text Solution

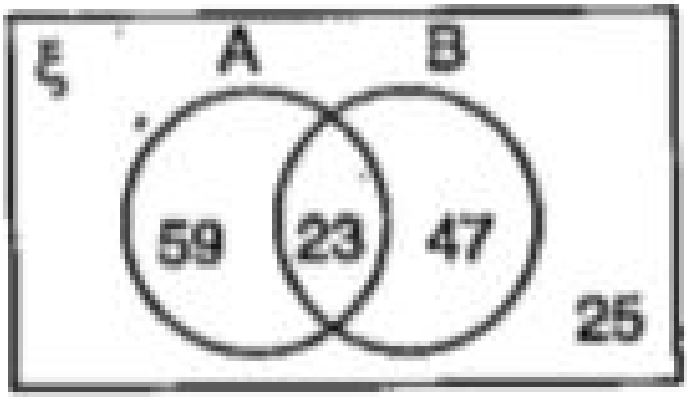
18. In the Venn diagram

$\xi = \{\text{people at a function}\}$

$A = \{\text{those who asked for tea}\}$

$B = \{\text{those who watched the ballet}\}$

Write down the number who: aksed for tea



View Text Solution

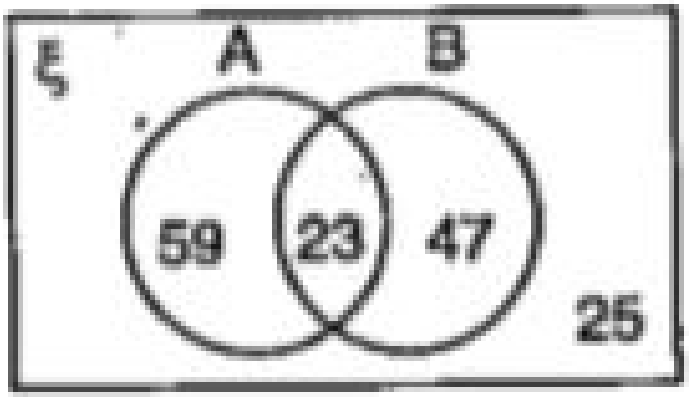
19. In the Venn diagram

$\xi = \{\text{people at a function}\}$

$A = \{\text{those who asked for tea}\}$

$B = \{\text{those who watched the ballet}\}$

Write down the number who: asked for tea and watched the ballet



View Text Solution

20. In the Venn diagram

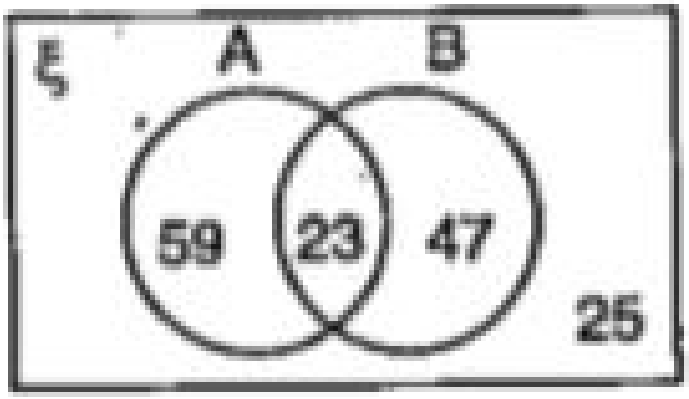
$\xi = \{\text{people at a function}\}$

$A = \{\text{those who asked for tea}\}$

$B = \{\text{those who watched the ballet}\}$

Write down the number who: neither asked for tea nor watched the

ballet



View Text Solution

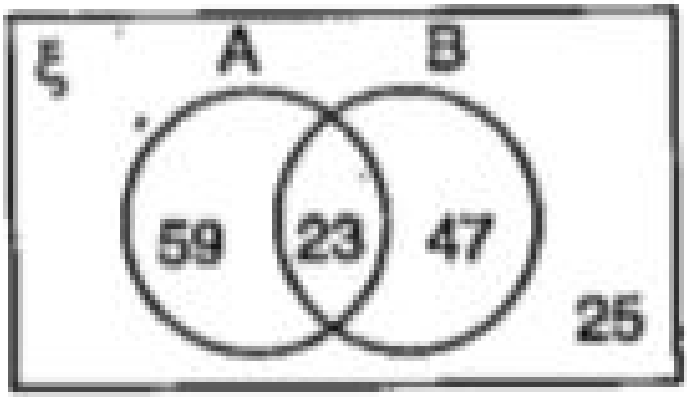
21. In the Venn diagram

$\xi = \{\text{people at a function}\}$

$A = \{\text{those who asked for tea}\}$

$B = \{\text{those who watched the ballet}\}$

Write down the number who: attended the function



View Text Solution

22. In a group of 30 people, 18 play squash and 19 play tennis. How many play both games, provided everyone plays at least one game?

View Text Solution

23. In a class of 50 students, 22 like History,25 like Geography and 10 like both subjects. Draw a Venn diagram and find the number of of students who do not like History

View Text Solution

24. In a class of 50 students, 22 like History,25 like Geography and 10 like both subjects. Draw a Venn diagram and find the number of of students who do not like Geography

View Text Solution

25. In a class of 50 students, 22 like History,25 like Geography and 10 like both subjects. Draw a Venn diagram and find the number of of students who like neither History no Geography

View Text Solution

26. 2000 candidates appear in a written test in Mathematics and Gerneral Awareness for a Government job. 1800 passed in at least one subject. If 1200 passed in Mathematice and 1500 in General Awareness find: how many passed in both the subjects?

View Text Solution

27. 2000 candidates appear in a written test in Mathematics and Gerneral Awareness for a Government job. 1800 passed in at least one subject. If 1200 passed in Mathematice and 1500 in General Awareness find: how many passed in Mathematics only?

View Text Solution

28. 2000 candidates appear in a written test in Mathematics and Gerneral Awareness for a Government job. 1800 passed in at least one subject. If 1200 passed in Mathematice and 1500 in General Awareness find: how many failed in General Awareness?

View Text Solution

29. In a group of 80 people, 40 like Indian food, 36 like Chinese food and 27 do not like any kind of these foods. Draw Venn diagram to find: how

many like both kind of food?

View Text Solution

30. In a group of 80 people, 40 like Indian food, 36 like Chinese food and 27 do not like any kind of these foods. Draw Venn diagram to find: how many like only the Indian food?

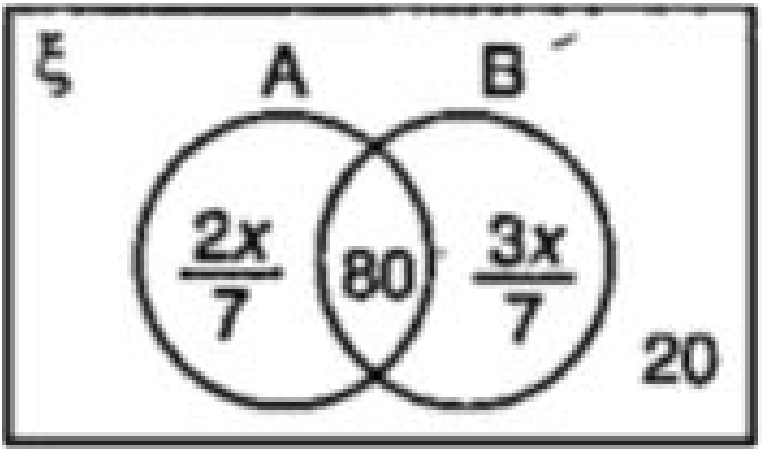
View Text Solution

31. In a group of 80 people, 40 like Indian food, 36 like Chinese food and 27 do not like any kind of these foods. Draw Venn diagram to find: how many like only the Chinese food?

View Text Solution

32. In a group of people, two-seventh speak Bengali only and three-seventh speak Hindi only. If 20 people speak none of these languages and

80 speak both, find using Venn diagram the total number of people in the group.



View Text Solution

33. In a class of 150 students, the following results were obtained in a certain examination, 45 students failed in Maths, 50 students failed in Physics, 48 students failed in Chemistry, 30 students failed in both Maths and Physics, 32 failed in all the three subjects. Draw a Venn diagram corresponding to this data. and find the number or students who have failed in at least one subject.

View Text Solution

34. A firm has 40 workers working in the factory premises, 30 working in its office and 20 working in both the places. How many workers are there in the firm? How many are working in the (i) factory (ii) office alone?

View Text Solution

Chapter Test

1. If $A = \{1, 2, 3, 4, 5, 6\}$ and $B = \{\text{whole numbers less than } 6\}$, then A=B.

View Text Solution

2. The empty set has no subsets.

View Text Solution

3. The empty set may be represented by (ϕ)

View Text Solution

4. $\{1, 2\} = \{2, 1\}$

View Text Solution

5. $\phi = \{0\}$

View Text Solution

6. $\phi \subset \{1, 2\}$

View Text Solution

7. Given that $A = \{x \mid x \text{ is a square}\}$ and $B = \{x \mid x \text{ is a rectangle}\}$.

State which of the following is true: A=B or $A \neq B$

View Text Solution

8. The total number of subsets of a finite set which contains n elements is 2^n.

View Text Solution

9. If $A \subset B$ and $C \subset B$, then $A \subset C'$

View Text Solution

10. The cardinal number of the set of the letters in the word 'INDIA' is 4.

View Text Solution

11. There are as many numbers in the set of natural numbers as in the set of natural numbers divisible by 17.

View Text Solution

12. If $n(A) = n(B)$ then $A \leftrightarrow B$ i.e., A and B are equivalent sets.

View Text Solution

13. If $x \in A'$, then $x \not\in (A')'$

View Text Solution

14. If $A = \{0, 2, 4\}$, and $B = \{0, 3, 5, 7\}$, then $A \cap B = \phi$.

View Text Solution

15. $\xi \cap \phi' = \xi$

View Text Solution

16. The union of two overlapping (intersecting) sets is either of the two sets.

View Text Solution

17. $A \cap B = \phi$ then $A \cap \phi = B$

View Text Solution

18. For any sets X and Y, $(X \cap Y)' - X' \cap Y'$

View Text Solution

19. For any sets A and B $A \cup B = B \cup A$.

View Text Solution

20. A is the set of all integers from 20 to 70, both inclusive.

$B = \{x : x \in A, \text{x is a perfect square}\}$

$C = \{x : x \in A, \quad \text{x is a prime number}\}$

$D = \{x : x \in A, x \quad \text{is the first digit of} \quad x > \quad \text{its second digit}\}$.

List the following sets.

(i) $B \cap C$ (ii) $B \cap D$ (iii) $B \cap C \cap D$

View Text Solution

21. If $X = \{a, b, c, d\}$ and $Y = \{f, b, d, g\}$ find X-Y

View Text Solution

22. If $X = \{a, b, c, d\}$ and $Y = \{f, b, d, g\}$ find Y-X

View Text Solution

23. If $X = \{a, b, c, d\}$ and $Y = \{f, b, d, g\}$ find $X \cap Y$

View Text Solution

24. If $X = \{a, b, c, d\}$ and $Y = \{f, b, d, g\}$ find $X \cup Y$

View Text Solution

25. Let

$\xi = \{1, 2, 3, 4, 5, 6, 7, 8, 9\}$, $A = \{1, 2, 3, 4\}$, $B = \{2, 4, 6, 8\}$ and $C = \{3,$

, find A'

View Text Solution

26. Let

$\xi = \{1, 2, 3, 4, 5, 6, 7, 8, 9\}, A = \{1, 2, 3, 4\}, B = \{2, 4, 6, 8\}$ and $C = \{3,$

, find B'

View Text Solution

27. Let

$\xi = \{1, 2, 3, 4, 5, 6, 7, 8, 9\}, A = \{1, 2, 3, 4\}, B = \{2, 4, 6, 8\}$ and $C = \{3,$

, find $(A \cup C)'$

View Text Solution

28. Let

$\xi = \{1, 2, 3, 4, 5, 6, 7, 8, 9\}, A = \{1, 2, 3, 4\}, B = \{2, 4, 6, 8\}$ and $C = \{3,$

, find $(A \cup B)'$

View Text Solution

29. Let

$\xi = \{1, 2, 3, 4, 5, 6, 7, 8, 9\}, A = \{1, 2, 3, 4\}, B = \{2, 4, 6, 8\}$ and $C = \{3,$

, find $(A \cap C)'$

View Text Solution

30. Let

$\xi = \{1, 2, 3, 4, 5, 6, 7, 8, 9\}, A = \{1, 2, 3, 4\}, B = \{2, 4, 6, 8\}$ and $C = \{3,$

, find (A')

View Text Solution

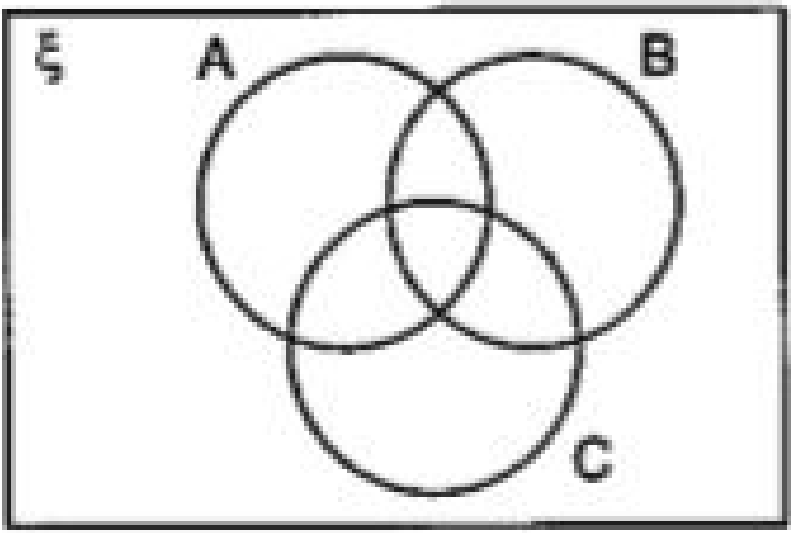
31. Let

$\xi = \{1, 2, 3, 4, 5, 6, 7, 8, 9\}, A = \{1, 2, 3, 4\}, B = \{2, 4, 6, 8\}$ and $C = \{3,$

, find $(B - C)'$

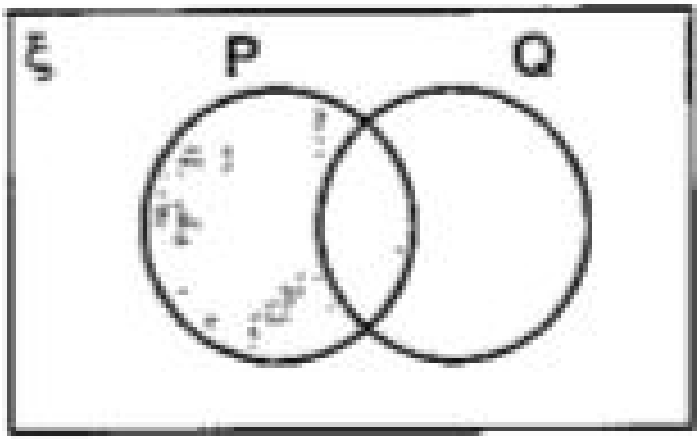
View Text Solution

32. In the Venn diagram, shade the set $A \cup (B \cap C')$



View Text Solution

33. Express in set notation the subset shaded in the Venn diagram.



View Text Solution

34. In a class of 36 students, 25 study History, 20 study Geography and 4 study neither History nor Geography. Find how many students study both History and Geography?

View Text Solution

35. $\xi = \{x : x \text{ is an integer and } 1 \leq x \leq 8\}$

$P = \{x : x > 5\}, Q = \{x : x \leq 3\}$

(i) (a) Find the value of $n(P \cup Q)$

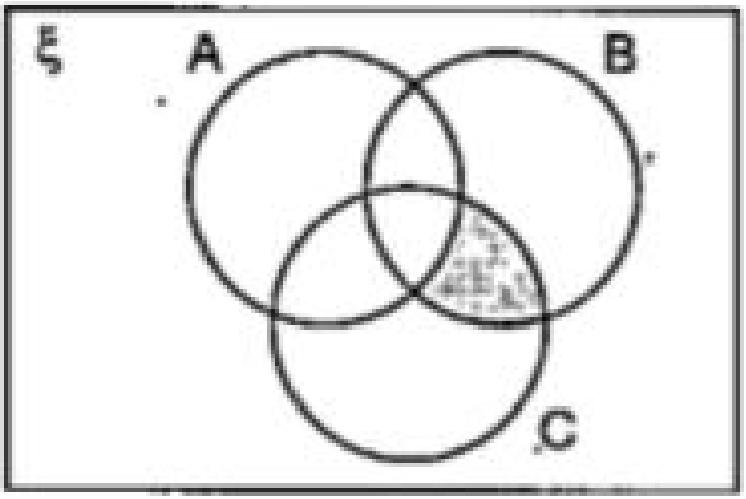
(b) List the elements of $P' \cap Q'$

View Text Solution

36. $\xi = \{x : x \text{ is an integer and } 1 \leq x \leq 8\}$

$P = \{x : x > 5\}, Q = \{x : x \leq 3\}$

Express, in set notation as simply as possible, the subset shaded in the Venn diagram.



View Text Solution

37. $\xi = \{x : x \text{ is an integer and } 1 \leq x \leq 8\}$

$P = \{x : x > 5\}, Q = \{x : x \leq 3\}$

It is given that $n(\xi) = 40, n(P) = 18, n(Q) = 20$ and $n(P \cap Q) = 7$.

Find (a) $n(P \cup Q)$, $(b)(P' \cup Q')$

View Text Solution

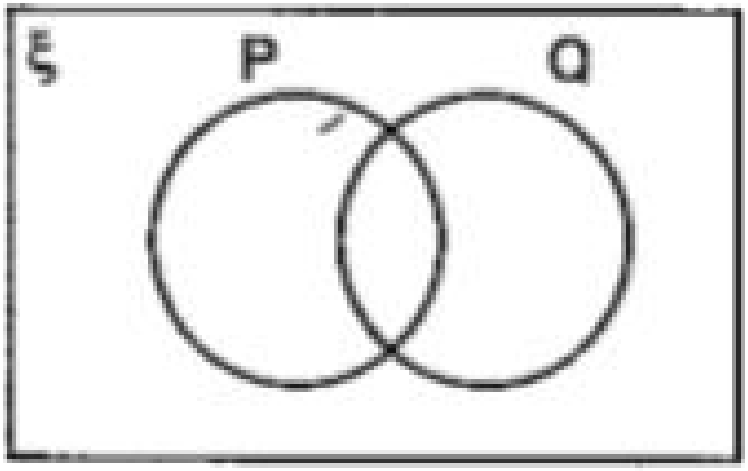
38. $\xi = \{x : x \text{ is an integer and } 1 \leq x \leq 8\}$

$P = \{x : x > 5\}, Q = \{x : x \leq 3\}$

There are 27 children in a class. Of these children, 19 own a bicycle, 15 own a scooter and 3 own neither a bicycle nor a scooter. Using a Venn diagram, or otherwise, find the number of children who own a bicycle but not a scooter.

View Text Solution

39. In the Venn diagram, shade $P \cup Q'$



View Text Solution

40. A group of 60 children attend an often school club. Of these, 35 children play football and 29 play hockey. 3 children do not play either football or hockey. But drawing a Venn diagram or otherwise, find the number of children who play only hockey.

View Text Solution

41. A, B and C are subsets of universal set ξ. If $A = \{2, 4, 6, 8, 12, 20\}, B = \{3, 6, 9, 12, 15\}, C = \{5, 10, 15, 20\}$ and ξ is the set of whole numbers, draw a Venn diagram showing the relation of A, B and C.

View Text Solution

42. If a set A has n elements then the number of elements in power set of A is

A. n

B. 2^n

C. n^2

D. none of these

Answer: b

View Text Solution

43. If a finite set S contains n elements, then the number of non-empty proper subsets of S is

A. 2.2^{n-1}

B. $2(2-1)$

C. $\left(2^{n-1}-1\right)$

D. $2\left(2^{n-1}-1\right)$

Answer: d

View Text Solution

44. If A, B, C are three non-zero sets, then $(A \cap B) \cap (B \cap C) \cap (C \cap A)$ is equal to

A. $A \cap B \cap C$

B. $A \cup B \cup C$

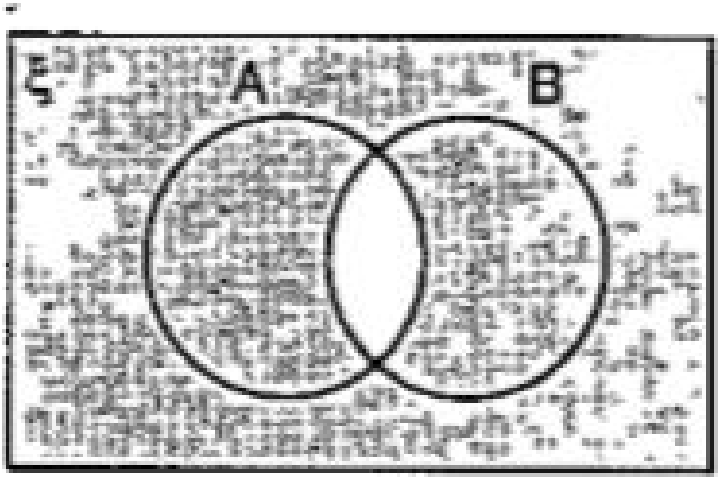
C. ϕ

D. none of these

Answer: Hint check by Venn diagram

View Text Solution

45. Consider the given Venn diagran if $n(\xi) = 42, n(A) = 15, n(B) = 12$ and $n(A \cup B) = 22$, then the area represented by the shaded portion in the Venn diagram is



A. 25

B. 27

C. 32

D. 37

Answer: d

View Text Solution

46. In a class of 100 students, 55 students have passed in mathematics and 67 students have passed in physics. Then the number of students who have passed in physics only is

A. 22

B. 33

C. 10

D. 45

Answer: d

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