



## MATHS

### NCERT - NCERT MATHEMATICS(TAMIL ENGLISH)

#### SET LANGUAGE

#### Example

1. Consider the set  $A = \{\text{Ashwin, Murali Vijay, Vijay Shankar, Badrinath}\}$ .

Fill in the blanks with the appropriate symbol  $\in$  or  $\notin$

Murali Vijay \_\_\_\_\_ A.



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2. Consider the set  $A = \{\text{Ashwin, Murali Vijay, Vijay Shankar, Badrinath}\}$ .

Fill in the blanks with the appropriate symbol  $\in$  or  $\notin$

Ashwin \_\_\_\_\_ A.



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3. Consider the set  $A = \{\text{Ashwin, Murali Vijay, Vijay Shankar, Badrinath}\}$ .

Fill in the blanks with the appropriate symbol  $\in$  or  $\notin$

Badrinath \_\_\_\_\_ A.



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4. Consider the set  $A = \{\text{Ashwin, Murali Vijay, Vijay Shankar, Badrinath}\}$ .

Fill in the blanks with the appropriate symbol  $\in$  or  $\notin$

Ganguly \_\_\_\_\_ A.



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5. Consider the set  $A = \{\text{Ashwin, Murali Vijay, Vijay Shankar, Badrinath}\}$ .

Fill in the blanks with the appropriate symbol  $\in$  or  $\notin$

Tendulkar \_\_\_\_\_ A



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6. Write the set of letters of the following words in Roster form

ASSESSMENT



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7. Write the set of letters of the following words in Roster form

PRINCIPAL



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8. If  $A = \{1,2,3,4,5,7,9,11\}$ , find  $n(A)$ .



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9. Are  $P = \{x: -3 \leq x \leq 0, x \in \mathbb{Z}\}$  and  $Q =$  The set of all prime factors of 210, equivalent sets?



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10.  $A = \{x: x \in \mathbb{N}, 4 \leq x \leq 8\}$  and  $B = \{4, 5, 6, 7, 8\}$  equal sets?



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11. Insert the appropriate symbol  $\subseteq$  or  $\not\subseteq$  in each blank to make a true statement.

$\{10, 20, 30\}$  \_\_\_  $\{10, 20, 30, 40\}$



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12. Insert the appropriate symbol  $\subseteq$  or  $\not\subseteq$  in each blank to make a true statement.

$\{p, q, r\}$  \_\_\_\_\_  $\{w, x, y, z\}$



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13. Write all the subsets of  $A = \{a, b\}$ .



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14. Verify whether  $A = \{20, 22, 23, 24\}$  and  $B = \{25, 30, 40, 45\}$  are disjoint sets.



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15. Find the number of subsets and the number of proper subsets of a set  $X = \{a, b, c, x, y, z\}$ .

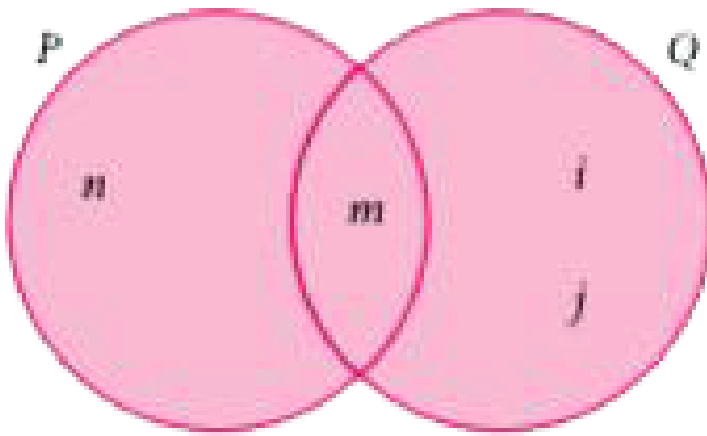


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16. If  $U = \{c, d, e, f, g, h, i, j\}$  and  $A = \{c, d, g, j\}$ , find  $A'$

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17. If  $P = \{m, n\}$  and  $Q = \{m, i, j\}$ , then, represent  $P$  and  $Q$  in Venn diagram and hence find  $P \cup Q$



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18. Let  $A = \{x : x \text{ is an even natural number and } 1 < x \leq 12\}$  and  $B = \{x : x \text{ is a multiple of } 3, x \in N \text{ and } x \leq 12\}$  be two sets. Find  $A \cap B$ .

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19. If  $A = \{2, 3\}$  and  $C = \{\}$ , find  $A \cap C$

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20. If  $A = \{-3, -2, 1, 4\}$  and  $B = \{0, 1, 2, 4\}$ , find

$A - B$

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21. If  $A = \{-3, -2, 1, 4\}$  and  $B = \{0, 1, 2, 4\}$ , find

$B - A$

 [View Text Solution](#)

22. If  $A = \{6, 7, 8, 9\}$  and  $B = \{8, 10, 12\}$ , find  $A \Delta B$

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23. From the given Venn diagram, write the elements of

$A$

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24. From the given Venn diagram, write the elements of

$B$

 [View Text Solution](#)

25. From the given Venn diagram, write the elements of

$A - B$

 [View Text Solution](#)

26. From the given Venn diagram, write the elements of

$B - A$

 [View Text Solution](#)



[View Text Solution](#)

27. From the given Venn diagram, write the elements of

$A'$



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28. From the given Venn diagram, write the elements of

$B'$



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29. From the given Venn diagram, write the elements of

$U$



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**30.** Draw Venn diagram and shade the region representing the following sets

$A'$



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**31.** Draw Venn diagram and shade the region representing the following sets

$(A - B)'$



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**32.** Draw Venn diagram and shade the region representing the following sets

$(A \cup B)'$



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33. If  $A = \{b, e, f, g\}$  and  $B = \{c, e, g, h\}$ , then verify the commutative property of union of sets

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34. If  $A = \{b, e, f, g\}$  and  $B = \{c, e, g, h\}$ , then verify the commutative property of intersection of sets.

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35. If  $A = \left\{ -\frac{1}{2}, 0, \frac{1}{4}, \frac{3}{4}, 2 \right\}$ ,  $B = \left\{ 0, \frac{1}{4}, \frac{3}{4}, 2, \frac{5}{2} \right\}$  and  $C = \left\{ -\frac{1}{2}, \frac{1}{4}, 1, 2 \right\}$ , then verify  $A \cap (B \cap C) = (A \cap B) \cap C$

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36. If  $A = \{0, 2, 4, 6, 8\}$ ,  $B = \{x: x \text{ is a prime number and } x < 11\}$  and  $C = \{x: x \in \mathbb{N} \text{ and } 5 \leq x < 9\}$  then verify

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

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37. Verify  $A \cap (B \cup C) = (A \cap B) \cup (A \cap C)$  using Venn diagrams.

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38. Verify  $A - (B \cup C) = (A - B) \cap (A - C)$  using Venn diagrams.

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39. If

$$P = \{x: x \in \mathbb{W} \text{ and } 0 < x < 10\}, Q = \{x: x = 2n + 1, n \in \mathbb{W} \text{ and } n < 5\}$$

, then verify  $P - (Q \cap R) = (P - Q) \cup (P - R)$



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40. If

$$U = \{x : x \in \mathbb{Z}, -2 \leq x \leq 10\}, A = \{x : x = 2p + 1, p \in \mathbb{Z}, -1 \leq p \leq 4\}$$

, verify De Morgan's laws for complementation.

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41. From the Venn diagram, verify that

$$n(A \cup B) = n(A) + n(B) - n(A \cap B)$$

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42. If  $n(A) = 36$ ,  $n(B) = 10$ ,  $n(A \cup B) = 40$ , and  $n(A') = 27$  find  $n(U)$  and  $n(A \cap B)$ .

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**43.** Let  $A = \{b, d, e, g, h\}$  and  $B = \{a, e, c, h\}$ . Verify that  $n(A - B) = n(A) - n(A \cap B)$ .



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**44.** In a school, all students play either Hockey or Cricket or both. 300 play Hockey, 250 play Cricket and 110 play both games. Find the number of students who play only Hockey.



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**45.** In a school, all students play either Hockey or Cricket or both. 300 play Hockey, 250 play Cricket and 110 play both games. Find the number of students who play only Cricket.



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**46.** In a school, all students play either Hockey or Cricket or both. 300 play Hockey, 250 play Cricket and 110 play both games. Find the total number of students in the School.



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**47.** In a party of 60 people, 35 had Vanilla ice cream, 30 had Chocolate ice cream. All the people had at least one ice cream. Then how many of them had, both Vanilla and Chocolate ice cream.



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**48.** In a party of 60 people, 35 had Vanilla ice cream, 30 had Chocolate ice cream. All the people had at least one ice cream. Then how many of them had, only Vanilla ice cream.



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**49.** In a college, 240 students play cricket, 180 students play football, 164 students play hockey, 42 play both cricket and football, 38 play both football and hockey, 40 play both cricket and hockey and 16 play all the three games. If each student participate in atleast one game, then find the number of students in the college

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**50.** In a college, 240 students play cricket, 180 students play football, 164 students play hockey, 42 play both cricket and football, 38 play both football and hockey, 40 play both cricket and hockey and 16 play all the three games. If each student participate in atleast one game, then find the number of students who play only one game.

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51. In a residential area with 600 families  $\frac{3}{5}$  owned scooter,  $\frac{1}{3}$  owned car,  $\frac{1}{4}$  owned bicycle, 120 families owned scooter and car, 86 owned car and bicycle while 90 families owned scooter and bicycle. If  $\frac{2}{15}$  of families owned all the three types of vehicles, then find the number of families owned atleast two types of vehicle.



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52. In a residential area with 600 families  $\frac{3}{5}$  owned scooter,  $\frac{1}{3}$  owned car,  $\frac{1}{4}$  owned bicycle, 120 families owned scooter and car, 86 owned car and bicycle while 90 families owned scooter and bicycle. If  $\frac{2}{15}$  of families owned all the three types of vehicles, then find the number of families owned no vehicle.



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53. In a group of 100 students, 85 students speak Tamil, 40 students speak English, 20 students speak French, 32 speak Tamil and English, 13

speak English and French and 10 speak Tamil and French. If each student knows atleast any one of these languages, then find the number of students who speak all these three languages.

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**54.** A survey was conducted among 200 magazine subscribers of three different magazines A, B and C. It was found that 75 members do not subscribe magazine A, 100 members do not subscribe magazine B, 50 members do not subscribe magazine C and 125 subscribe atleast two of the three magazines. Find

Number of members who subscribe exactly two magazines.

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**55.** A survey was conducted among 200 magazine subscribers of three different magazines A, B and C. It was found that 75 members do not subscribe magazine A, 100 members do not subscribe magazine B, 50 members do not subscribe magazine C and 125 subscribe atleast two of

the three magazines. Find

Number of members who subscribe only one magazine.

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## Exercise 1 1

1. Which of the following are sets?

The collection of prime numbers upto 100.

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2. Which of the following are sets?

The collection of rich people in India.

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3. Which of the following are sets?

The collection of all rivers in India.



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4. Which of the following are sets?

The collection of good Hockey players.



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5. List the set of letters of the following words in Roster form

INDIA



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6. List the set of letters of the following words in Roster form

PARALLELOGRAM





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7. List the set of letters of the following words in Roster form

MISSISSIPPI



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8. List the set of letters of the following words in Roster form

CZECHOSLOVAKIA



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9. Consider the following sets  $A = \{0, 3, 5, 8\}$ ,  $B = \{2, 4, 6, 10\}$  and  $C = \{12, 14, 18, 20\}$ .

State whether True or False:

$18 \in C$



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10. Consider the following sets  $A = \{0, 3, 5, 8\}$ ,  $B = \{2, 4, 6, 10\}$  and  $C = \{12, 14, 18, 20\}$ .

State whether True or False:

$$6 \notin A$$



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11. Consider the following sets  $A = \{0, 3, 5, 8\}$ ,  $B = \{2, 4, 6, 10\}$  and  $C = \{12, 14, 18, 20\}$ .

State whether True or False:

$$10 \in B$$



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12. Consider the following sets  $A = \{0, 3, 5, 8\}$ ,  $B = \{2, 4, 6, 10\}$  and  $C = \{12, 14, 18, 20\}$ .

Fill in the blanks:

$$3 \in \underline{\hspace{2cm}}$$



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13. Consider the following sets  $A = \{0, 3, 5, 8\}$ ,  $B = \{2, 4, 6, 10\}$  and  $C = \{12, 14, 18, 20\}$ .

Fill in the blanks:

$14 \in$  \_\_\_\_\_



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14. Consider the following sets  $A = \{0, 3, 5, 8\}$ ,  $B = \{2, 4, 6, 10\}$  and  $C = \{12, 14, 18, 20\}$ .

Fill in the blanks:

$18 \underline{\hspace{1cm}}$  B



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15. Consider the following sets  $A = \{0, 3, 5, 8\}$ ,  $B = \{2, 4, 6, 10\}$  and  $C = \{12, 14, 18, 20\}$ .

Fill in the blanks:

4 \_\_\_ B



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16. Represent the following sets in Roster form

A = The set of all even natural numbers less than 20.



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17. Represent the following sets in Roster form

$$B = \left\{ y : y = \frac{1}{2n}, n \in N, n \leq 5 \right\}$$



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18. Represent the following sets in Roster form

C = {x : x is perfect cube  $27 < x < 216$ }



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19. Represent the following sets in Roster form

$$D = \{x : x \in \mathbb{Z}, -5 < x \leq 2\}$$



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20. Represent the following sets in set builder form.

B = The set of all Cricket players in India who scored double centuries in One Day Internationals.



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21. Represent the following sets in set builder form.

$$C = \left\{ \frac{1}{2}, \frac{2}{3}, \frac{3}{4}, \dots \right\}$$



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22. Represent the following sets in set builder form.

D = The set of all tamil months in a year.

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23. Represent the following sets in set builder form.

E = The set of odd Whole numbers less than 9.

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24. Represent the following sets in descriptive form.

P = { January, June, July }

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25. Represent the following sets in descriptive form.

Q = { 7, 11, 13, 17, 19, 23, 29 }



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26. Represent the following sets in descriptive form.

$$R = \{x : x \in \mathbb{N}, x < 5\}$$

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27. Represent the following sets in descriptive form.

$$= \{x : x \text{ is a consonant in English alphabets}\}$$

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## Exercise 1 2

1. Find the cardinal number of the following sets.

$$M = \{p, q, r, s, t, u\}$$

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2. Find the cardinal number of the following sets.

$$P = \{x : x = 3n + 2, n \in \mathbb{W} \text{ and } x < 15\}$$



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3. Find the cardinal number of the following sets.

$$Q = \left\{ y : y = \frac{4}{3n}, n \in \mathbb{N} \text{ and } 2 < n \leq 5 \right\}$$



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4. Find the cardinal number of the following sets.

$$R = \{x : x \text{ is an integer, } x \in \mathbb{Z} \text{ and } -5 \leq x < 5\}$$



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5. Find the cardinal number of the following sets.

S = The set of all leap years between 1882 and 1906.

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6. Identify the following sets as finite or infinite

$X =$  The set of all districts in Tamilnadu

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7. Identify the following sets as finite or infinite

$Y =$  The set of all straight lines passing through a point.

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8. Identify the following sets as finite or infinite

$A = \{x : x \in \mathbb{Z} \text{ and } x < 5\}$

 [View Text Solution](#)

9. Identify the following sets as finite or infinite

$$B = \{x : x^2 - 5x + 6 = 0, x \in \mathbb{N}\}$$



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10. Which of the following sets are equivalent or unequal or equal sets?

A = The set of vowels in the English alphabets.

B = The set of all letters in the word "VOWEL"



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11. Which of the following sets are equivalent or unequal or equal sets?

$$C = \{2,3,4,5\} \quad D = \{x : x \in \mathbb{W}, 1 < x < 5\}$$



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12. Which of the following sets are equivalent or unequal or equal sets?

$X = \{x : x \text{ is a letter in the word "LIFE"}\}$   $Y = \{F, I, L, E\}$

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13. Which of the following sets are equivalent or unequal or equal sets?

$G = \{x : x \text{ is a prime number and } 3 < x < 23\}$   $H = \{x : x \text{ is a divisor of } 18\}$

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14. Identify the following sets as null set or singleton set.

$A = \{x : x \in \mathbb{N}, 1 < x < 2\}$

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15. Identify the following sets as null set or singleton set.

$B =$  The set of all even natural numbers which are not divisible by 2



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16. Identify the following sets as null set or singleton set.

$$C = \{0\}$$



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17. Identify the following sets as null set or singleton set.

D = The set of all triangles having four sides.



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18. State which pairs of sets are disjoint or overlapping?

$$A = \{f, i, a, s\} \text{ and } B = \{a, n, f, h, s\}$$



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19. State which pairs of sets are disjoint or overlapping?

$C = \{x : x \text{ is a prime number, } x > 2\}$  and  $D = \{x : x \text{ is an even prime number}\}$

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20. State which pairs of sets are disjoint or overlapping?

$E = \{x : x \text{ is a factor of } 24\}$  and  $F = \{x : x \text{ is a multiple of } 3, x < 30\}$

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21. If  $S = \{\text{square, rectangle, circle, rhombus, triangle}\}$ , list the elements of the following subset of  $S$ .

The set of shapes which have 4 equal sides.

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**22.** If  $S = \{\text{square, rectangle, circle, rhombus, triangle}\}$ , list the elements of the following subset of  $S$ .

The set of shapes which have radius.



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**23.** If  $S = \{\text{square, rectangle, circle, rhombus, triangle}\}$ , list the elements of the following subset of  $S$ .

The set of shapes in which the sum of all interior angles is  $180^\circ$



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**24.** If  $S = \{\text{square, rectangle, circle, rhombus, triangle}\}$ , list the elements of the following subset of  $S$ .

The set of shapes which have 5 sides.



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25. If  $A = \{a, \{a, b\}\}$ , write all the subsets of  $A$ .



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26. Write down the power set of the following sets:

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



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27. Write down the power set of the following sets:

$$B = \{1, 2, 3\}$$



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28. Write down the power set of the following sets:

$$D = \{p, q, r, s\}$$



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29. Write down the power set of the following sets:

$$E = \phi$$

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30. Find the number of subsets and the number of proper subsets of the following sets.

$$W = \{\text{red, blue, yellow}\}$$

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31. Find the number of subsets and the number of proper subsets of the following sets.

$$X = \{x^2 : x \in N, x^2 \leq 100\}$$

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32. If  $n(A) = 4$ , find  $n[P(A)]$ .



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33. If  $n(A)=0$ , find  $n[P(A)]$ .



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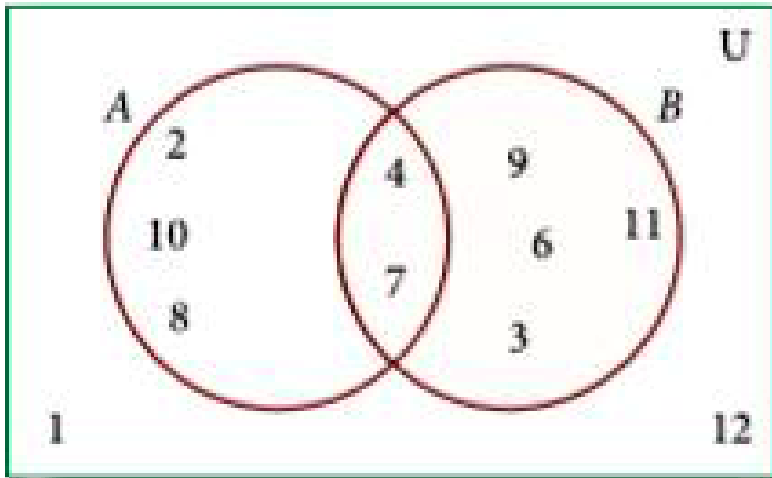
34. If  $n[P(A)] = 256$ , find  $n(A)$ .



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## Exercise 1 3

1. Using the given Venn diagram, write the elements of

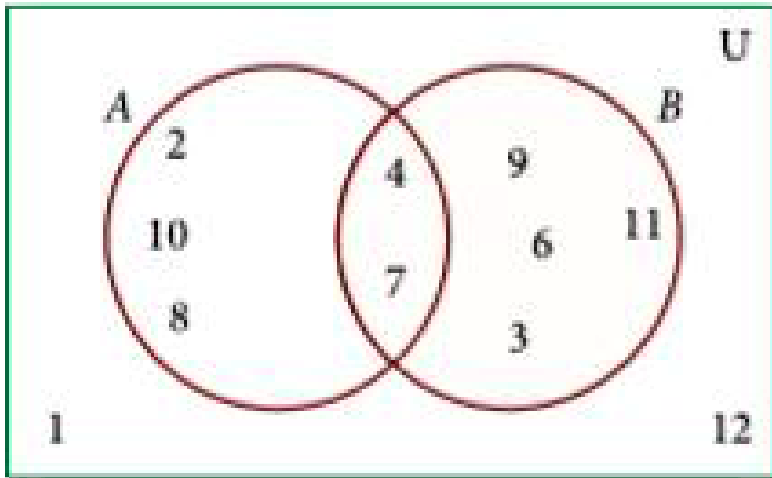


A



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2. Using the given Venn diagram, write the elements of

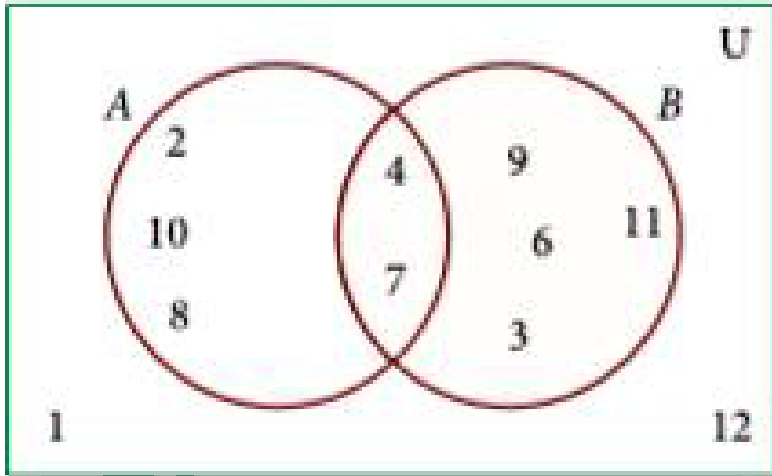


B



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3. Using the given Venn diagram, write the elements of



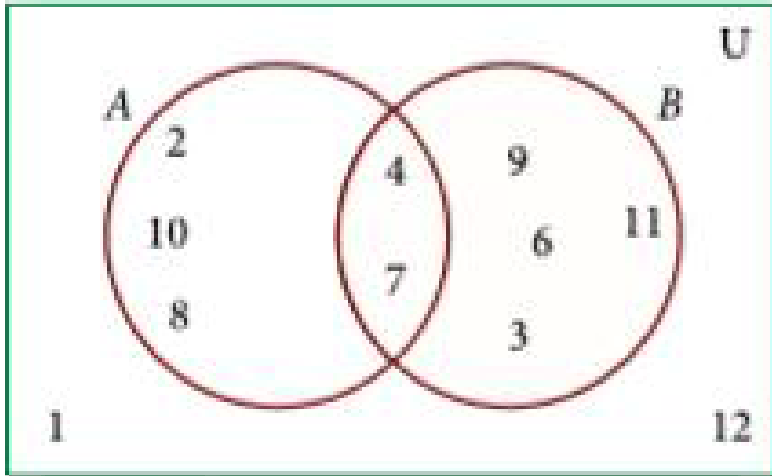
$A \cup B$



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4. Using the given Venn diagram, write the elements of

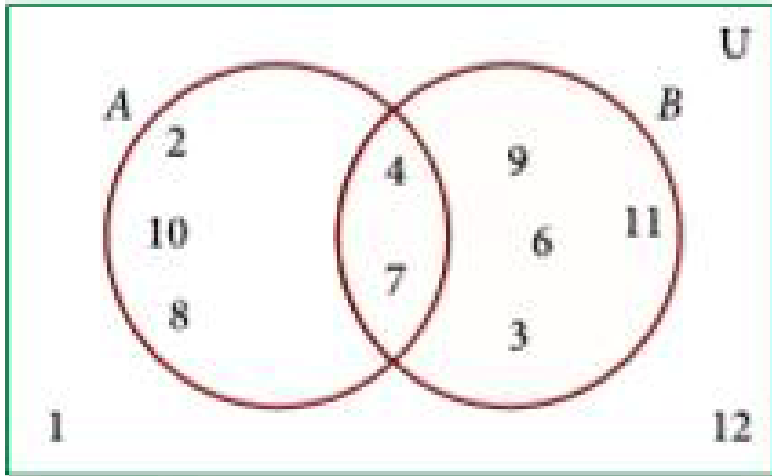


$A \cap B$



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5. Using the given Venn diagram, write the elements of

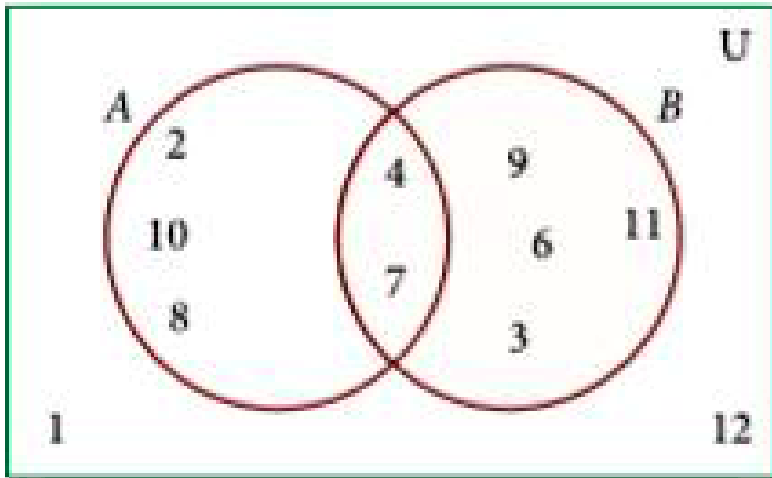


$A - B$



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6. Using the given Venn diagram, write the elements of

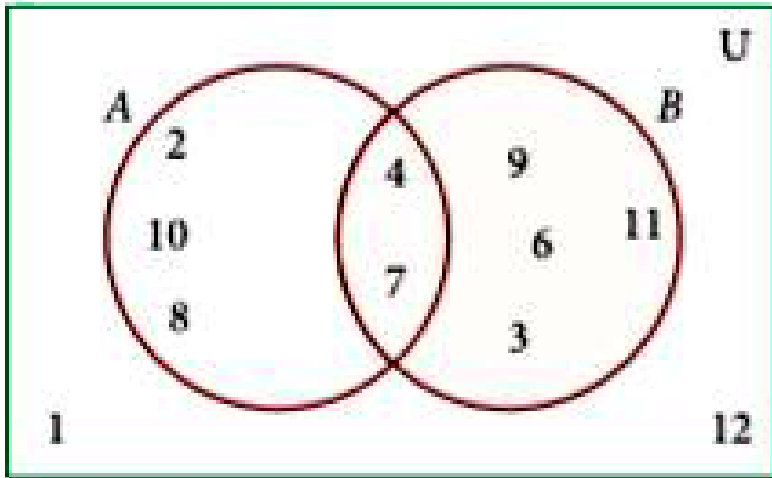


$B - A$



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7. Using the given Venn diagram, write the elements of

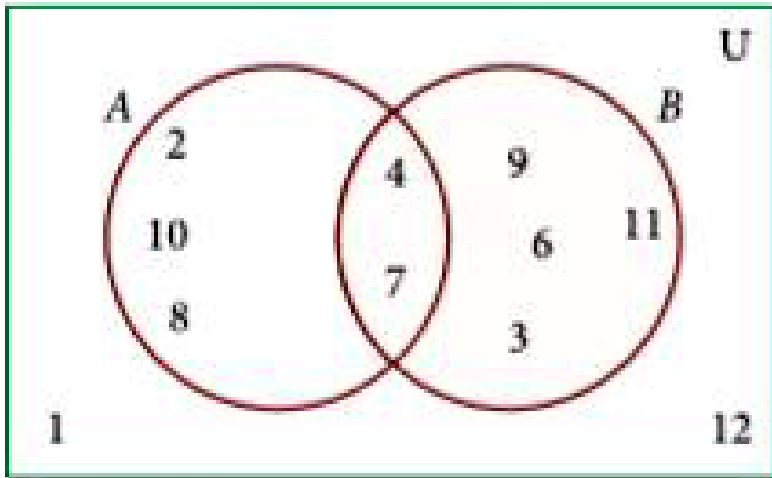


A'



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8. Using the given Venn diagram, write the elements of

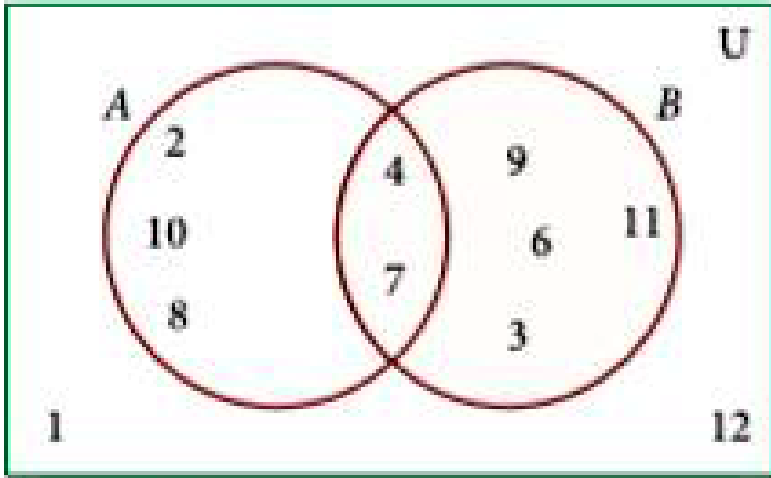


B'



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9. Using the given Venn diagram, write the elements of



U



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10. Find  $A \cup B$ ,  $A \cap B$ ,  $A - B$  and  $B - A$  for the following sets.

$A = \{2, 6, 10, 14\}$  and  $B = \{2, 5, 14, 16\}$



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11. Find  $A \cup B$ ,  $A \cap B$ ,  $A - B$  and  $B - A$  for the following sets.

$A = \{a, b, c, e, u\}$  and  $B = \{a, e, i, o, u\}$



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12. Find  $A \cup B$ ,  $A \cap B$ ,  $A - B$  and  $B - A$  for the following sets.

$A = \{x : x \in N, x \leq 10\}$  and  $B = \{x : x \in W, x < 6\}$



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13. Find  $A \cup B$ ,  $A \cap B$ ,  $A - B$  and  $B - A$  for the following sets.

$A =$  Set of all letters in the word “mathematics” and

$B =$  Set of all letters in the word “geometry”



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14. If  $U = \{a, b, c, d, e, f, g, h\}$ ,  $A = \{b, d, f, h\}$  and  $B = \{a, d, e, h\}$ , find the following sets.

$A'$



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15. If  $U = \{a, b, c, d, e, f, g, h\}$ ,  $A = \{b, d, f, h\}$  and  $B = \{a, d, e, h\}$ , find the following sets.

$B'$



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16. If  $U = \{a, b, c, d, e, f, g, h\}$ ,  $A = \{b, d, f, h\}$  and  $B = \{a, d, e, h\}$ , find the following sets.

$A' \cup B'$



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17. If  $U = \{a, b, c, d, e, f, g, h\}$ ,  $A = \{b, d, f, h\}$  and  $B = \{a, d, e, h\}$ , find the following sets.

$$A' \cap B'$$

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18. If  $U = \{a, b, c, d, e, f, g, h\}$ ,  $A = \{b, d, f, h\}$  and  $B = \{a, d, e, h\}$ , find the following sets.

$$(A \cup B)'$$

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19. If  $U = \{a, b, c, d, e, f, g, h\}$ ,  $A = \{b, d, f, h\}$  and  $B = \{a, d, e, h\}$ , find the following sets.

$$(A \cap B)'$$

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20. If  $U = \{a, b, c, d, e, f, g, h\}$ ,  $A = \{b, d, f, h\}$  and  $B = \{a, d, e, h\}$ , find the following sets.

(A)'



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21. If  $U = \{a, b, c, d, e, f, g, h\}$ ,  $A = \{b, d, f, h\}$  and  $B = \{a, d, e, h\}$ , find the following sets.

(B)'



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22. Let  $U = \{0, 1, 2, 3, 4, 5, 6, 7\}$ ,  $A = \{1, 3, 5, 7\}$  and  $B = \{0, 2, 3, 5, 7\}$ , find the following sets.

A'



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23. Let  $U = \{0, 1, 2, 3, 4, 5, 6, 7\}$ ,  $A = \{1, 3, 5, 7\}$  and  $B = \{0, 2, 3, 5, 7\}$ ,

find the following sets.

$B'$



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24. Let  $U = \{0, 1, 2, 3, 4, 5, 6, 7\}$ ,  $A = \{1, 3, 5, 7\}$  and  $B = \{0, 2, 3, 5, 7\}$ ,

find the following sets.

$A' \cup B'$



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25. Let  $U = \{0, 1, 2, 3, 4, 5, 6, 7\}$ ,  $A = \{1, 3, 5, 7\}$  and  $B = \{0, 2, 3, 5, 7\}$ ,

find the following sets.

$A' \cap B'$



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26. Let  $U = \{0, 1, 2, 3, 4, 5, 6, 7\}$ ,  $A = \{1, 3, 5, 7\}$  and  $B = \{0, 2, 3, 5, 7\}$ ,

find the following sets.

$$(A \cup B)'$$



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27. Let  $U = \{0, 1, 2, 3, 4, 5, 6, 7\}$ ,  $A = \{1, 3, 5, 7\}$  and  $B = \{0, 2, 3, 5, 7\}$ ,

find the following sets.

$$(A \cap B)'$$



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28. Let  $U = \{0, 1, 2, 3, 4, 5, 6, 7\}$ ,  $A = \{1, 3, 5, 7\}$  and  $B = \{0, 2, 3, 5, 7\}$ ,

find the following sets.

$$(A)'$$



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29. Let  $U = \{0, 1, 2, 3, 4, 5, 6, 7\}$ ,  $A = \{1, 3, 5, 7\}$  and  $B = \{0, 2, 3, 5, 7\}$ ,

find the following sets.

$(B)'$



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30. Find the symmetric difference between the following sets.

$P = \{2, 3, 5, 7, 11\}$  and  $Q = \{1, 3, 5, 11\}$



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31. Find the symmetric difference between the following sets.

$R = \{l, m, n, o, p\}$  and  $S = \{j, l, n, q\}$



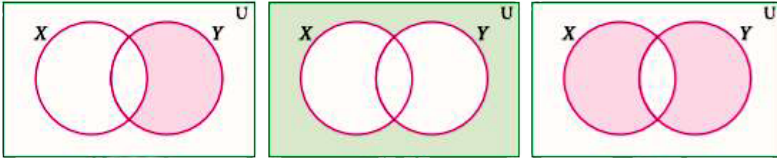
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32. Find the symmetric difference between the following sets.

$X = \{5, 6, 7\}$  and  $Y = \{5, 7, 9, 10\}$

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33. Using the set symbols, write down the expressions for the shaded region in the following



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34. Let A and B be two overlapping sets and the universal set be U. Draw appropriate Venn diagram for each of the following,

$$A \cup B$$

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35. Let A and B be two overlapping sets and the universal set be U. Draw appropriate Venn diagram for each of the following,

$$A \cap B$$



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**36.** Let A and B be two overlapping sets and the universal set be U. Draw appropriate Venn diagram for each of the following,

$$(A \cap B)'$$



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**37.** Let A and B be two overlapping sets and the universal set be U. Draw appropriate Venn diagram for each of the following,

$$(B - A)'$$



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**38.** Let A and B be two overlapping sets and the universal set be U. Draw appropriate Venn diagram for each of the following,

$$A' \cup B'$$



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**39.** Let A and B be two overlapping sets and the universal set be U. Draw appropriate Venn diagram for each of the following,

$$A' \cap B'$$



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**40.** Let A and B be two overlapping sets and the universal set be U. Draw appropriate Venn diagram for each of the following,

What do you observe from the Venn diagram (iii) and (v)?



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1.

If

$P = \{1, 2, 5, 7, 9\}$ ,  $Q = \{2, 3, 5, 9, 11\}$ ,  $R = \{3, 4, 5, 7, 9\}$  and  $S = \{2, 3, 4, 5, 7, 9, 11\}$

, then find

$$(P \cup Q) \cup R$$



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2.

If

$P = \{1, 2, 5, 7, 9\}$ ,  $Q = \{2, 3, 5, 9, 11\}$ ,  $R = \{3, 4, 5, 7, 9\}$  and  $S = \{2, 3, 4, 5, 7, 9, 11\}$

, then find

$$(P \cap Q) \cap S$$



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3.

If

$P = \{1, 2, 5, 7, 9\}$ ,  $Q = \{2, 3, 5, 9, 11\}$ ,  $R = \{3, 4, 5, 7, 9\}$  and  $S = \{2, 3, 4, 5, 7, 9, 11\}$

, then find

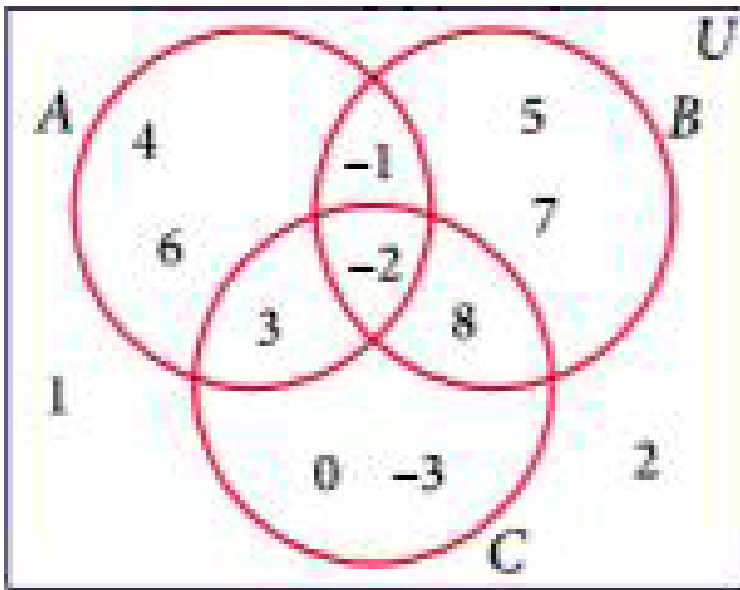
$$(Q \cap S) \cap R$$



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### Exercise 1 5

1. Using the adjacent Venn diagram, find the following sets:

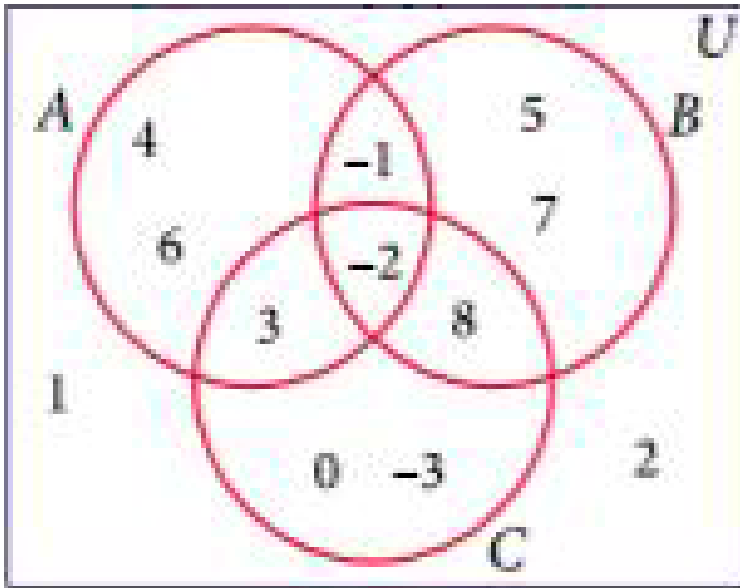


$A - B$



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2. Using the adjacent Venn diagram, find the following sets:

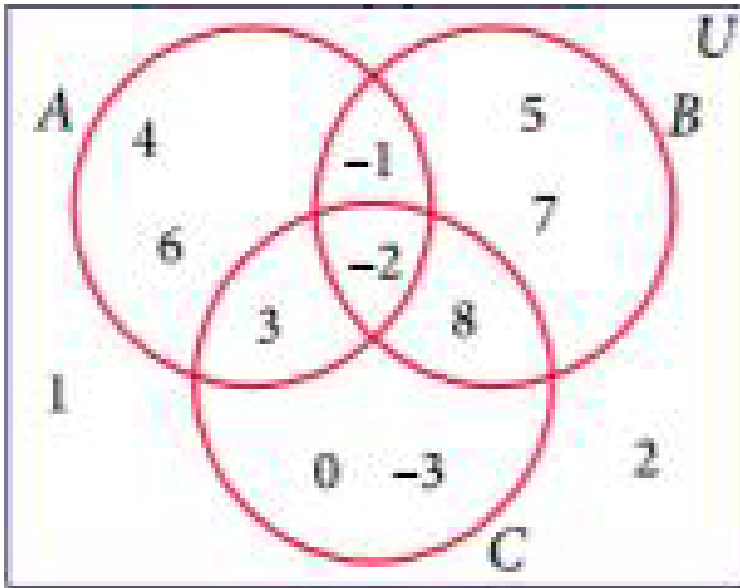


$B - C$



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3. Using the adjacent Venn diagram, find the following sets:

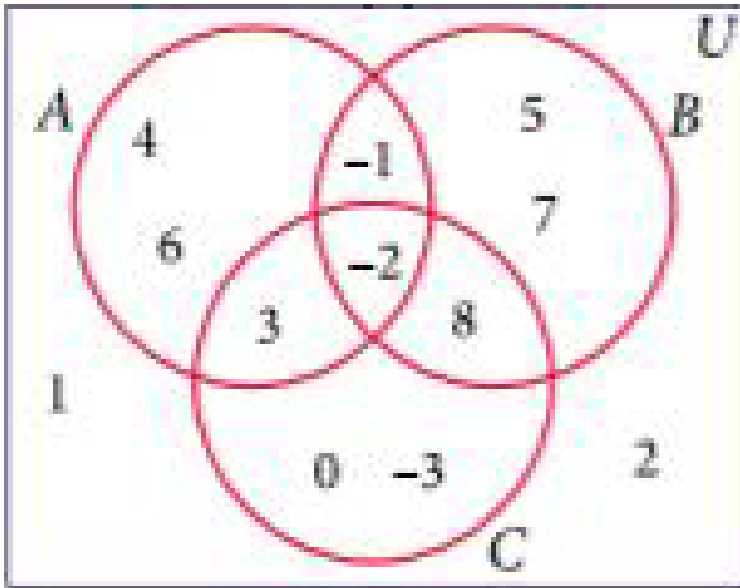


$$A' \cup B'$$



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4. Using the adjacent Venn diagram, find the following sets:

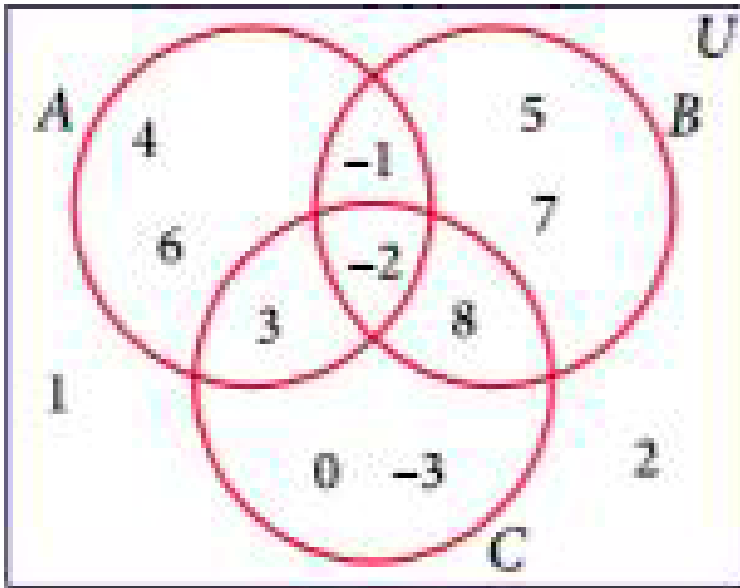


$$A' \cap B'$$



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5. Using the adjacent Venn diagram, find the following sets:

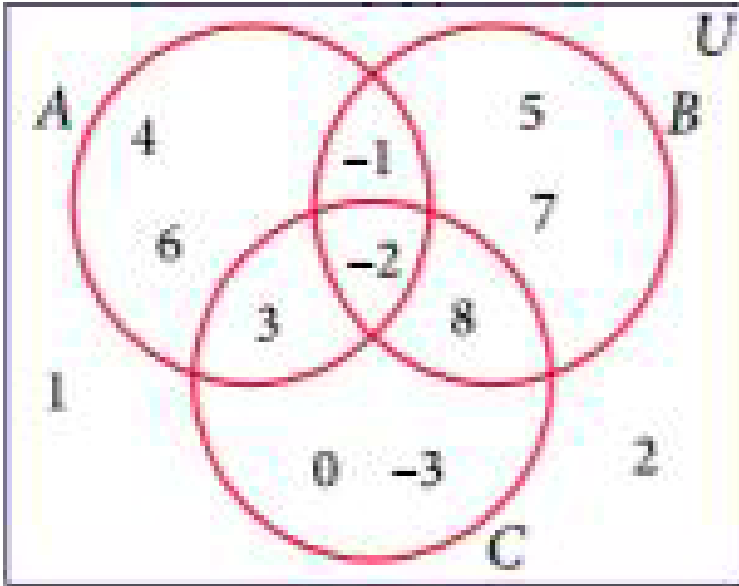


$(B \cup C)'$



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6. Using the adjacent Venn diagram, find the following sets:

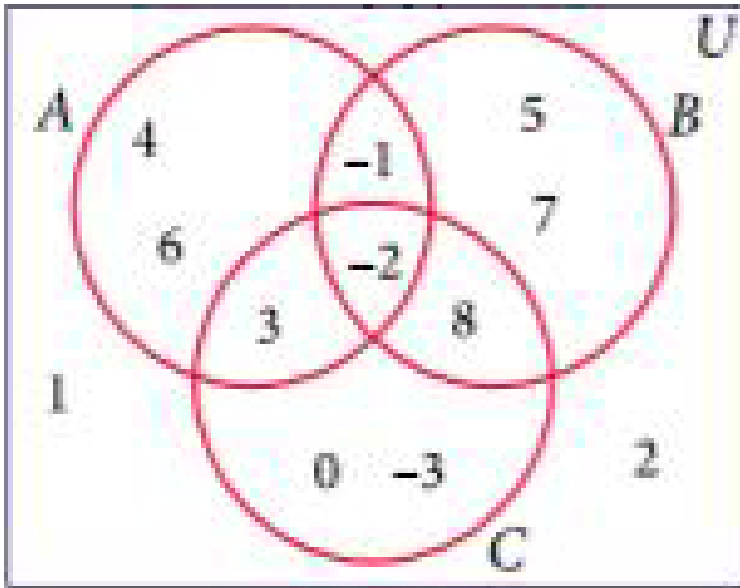


$$A - (B \cup C)$$



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7. Using the adjacent Venn diagram, find the following sets:



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

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8. If  $K = \{a, b, d, e, f\}$ ,  $L = \{b, c, d, g\}$  and  $M = \{a, b, c, d, h\}$  then find the following and verify distributive laws.

$$K \cup (L \cap M)$$

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9. If  $K = \{a, b, d, e, f\}$ ,  $L = \{b, c, d, g\}$  and  $M = \{a, b, c, d, h\}$  then find the following and verify distributive laws.

$$K \cap (L \cup M)$$



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10. If  $K = \{a, b, d, e, f\}$ ,  $L = \{b, c, d, g\}$  and  $M = \{a, b, c, d, h\}$  then find the following and verify distributive laws.

$$(K \cup L) \cap (K \cup M)$$



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11. If  $K = \{a, b, d, e, f\}$ ,  $L = \{b, c, d, g\}$  and  $M = \{a, b, c, d, h\}$  then find the following and verify distributive laws.

$$(K \cap L) \cup (K \cap M)$$



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## Exercise 1 6

1. If  $n(A) = 25$ ,  $n(B) = 40$ ,  $n(A \cup B) = 50$  and  $n(B') = 25$ , find  $n(A \cap B)$  and  $n(U)$ .

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2. If  $n(A) = 300$ ,  $n(A \cup B) = 500$ ,  $n(A \cap B) = 50$  and  $n(B') = 350$ , find  $n(B)$  and  $n(U)$

 [View Text Solution](#)

3. In a class, all students take part in either music or drama or both. 25 students take part in music, 30 students take part in drama and 8 students take part in both music and drama. Find

The number of students who take part in only music.

 [View Text Solution](#)

4. In a class, all students take part in either music or drama or both. 25 students take part in music, 30 students take part in drama and 8 students take part in both music and drama. Find

The number of students who take part in only drama.



[View Text Solution](#)

5. In a class, all students take part in either music or drama or both. 25 students take part in music, 30 students take part in drama and 8 students take part in both music and drama. Find

The total number of students in the class.



[View Text Solution](#)

6. In a party of 45 people, each one likes tea or coffee or both. 35 people like tea and 20 people like coffee. Find the number of people who like both tea and coffee.



[View Text Solution](#)

7. In a party of 45 people, each one likes tea or coffee or both. 35 people like tea and 20 people like coffee. Find the number of people who do not like Tea.



[View Text Solution](#)

8. In a party of 45 people, each one likes tea or coffee or both. 35 people like tea and 20 people like coffee. Find the number of people who do not like coffee.



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9. In an examination 50% of the students passed in Mathematics and 70% of students passed in Science while 10% students failed in both subjects. 300 students passed in both the subjects. Find the total number of

students who appeared in the examination, if they took examination in only two subjects.

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10. A and B are two sets such that  $n(A - B) = 32 + x$ ,  $n(B_A) = 5x$  and  $n(A \cap B) = x$ . Illustrate the information by means of a Venn diagram. Given that  $n(A) = n(B)$ , calculate the value of  $x$ .

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11. Out of 500 car owners investigated, 400 owned car A and 200 owned car B, 50 owned both A and B cars. Is this data correct?

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**12.** In a colony, 275 families buy Tamil newspaper, 150 families buy English newspaper, 45 families buy Hindi newspaper, 125 families buy Tamil and English newspapers, 17 families buy English and Hindi newspapers, 5 families buy Tamil and Hindi newspapers and 3 families buy all the three newspapers. If each family buy atleast one of these newspapers then find Number of families buy only one newspaper

 [View Text Solution](#)

**13.** In a colony, 275 families buy Tamil newspaper, 150 families buy English newspaper, 45 families buy Hindi newspaper, 125 families buy Tamil and English newspapers, 17 families buy English and Hindi newspapers, 5 families buy Tamil and Hindi newspapers and 3 families buy all the three newspapers. If each family buy atleast one of these newspapers then find Number of families buy atleast two newspapers

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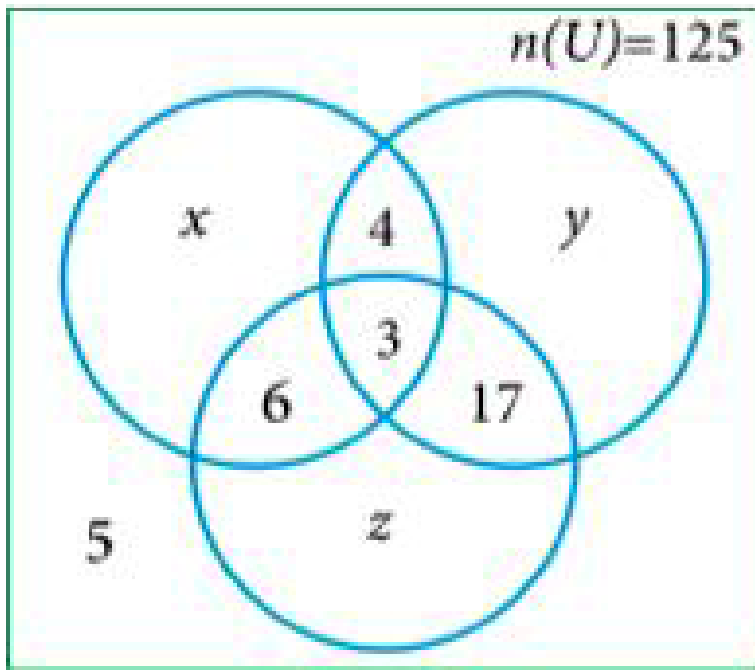
14. In a colony, 275 families buy Tamil newspaper, 150 families buy English newspaper, 45 families buy Hindi newspaper, 125 families buy Tamil and English newspapers, 17 families buy English and Hindi newspapers, 5 families buy Tamil and Hindi newspapers and 3 families buy all the three newspapers. If each family buy atleast one of these newspapers then find Total number of families in the colony.

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15. A survey of 1000 farmers found that 600 grew paddy, 350 grew ragi, 280 grew corn, 120 grew paddy and ragi, 100 grew ragi and corn, 80 grew paddy and corn. If each farmer grew atleast any one of the above three, then find the number of farmers who grew all the three.

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16. In the adjacent diagram, if  $n(U) = 125$ ,  $y$  is two times of  $x$  and  $z$  is 10 more than  $x$ , then find the value of  $x$ ,  $y$  and  $z$ .



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17. Each student in a class of 35 plays atleast one game among chess, carrom and table tennis. 22 play chess, 21 play carrom, 15 play table tennis, 10 play chess and table tennis, 8 play carrom and table tennis and 6 play all the three games. Find the number of students who play chess and carrom but not table tennis

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**18.** Each student in a class of 35 plays atleast one game among chess, carrom and table tennis. 22 play chess, 21 play carrom, 15 play table tennis, 10 play chess and table tennis, 8 play carrom and table tennis and 6 play all the three games. Find the number of students who play only chess



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**19.** Each student in a class of 35 plays atleast one game among chess, carrom and table tennis. 22 play chess, 21 play carrom, 15 play table tennis, 10 play chess and table tennis, 8 play carrom and table tennis and 6 play all the three games. Find the number of students who play only carrom



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**20.** In a class of 50 students, each one come to school by bus or by bicycle or on foot. 25 by bus, 20 by bicycle, 30 on foot and 10 students by all the

three. Now how many students come to school exactly by two modes of transport?

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## Exercise 1 7 Multiple Choice Questions

1. Which of the following is correct?

- A.  $\{7\} \in \{1, 2, 3, 4, 5, 6, 7, 8, 9, 10\}$
- B.  $7 \in \{1, 2, 3, 4, 5, 6, 7, 8, 10\}$
- C.  $7 \notin \{1, 2, 3, 4, 5, 6, 7, 8, 9, 10\}$
- D.  $\{7\} \notin \{1, 2, 3, 4, 5, 6, 7, 8, 9, 10\}$

**Answer: B**

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2. The set  $P = \{x \mid x \in \mathbb{Z}, -1 < x < 1\}$  is a

A. Singleton set

B. Power set

C. Null set

D. Subset

**Answer: A**



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3. If  $U = \{x \mid x \in \mathbb{N}, x < 10\}$  and  $A = \{x \mid x \in \mathbb{N}, 2 \leq x < 6\}$  then

(A') is

A.  $\{1,6,7,8,9\}$

B.  $\{1,2,3,4\}$

C.  $\{2,3,4,5\}$

D.  $\{\}$

**Answer: C**



**View Text Solution**

4. If  $B \subseteq A$  then  $n(A \cap B)$  is

A.  $n(A - B)$

B.  $n(B)$

C.  $n(B - A)$

D.  $n(A)$

**Answer: B**



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5. If  $A = \{x, y, z\}$  then the number of non- empty subsets of A is

A. 8

B. 5

C. 6

D. 7

**Answer: D**

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**6. Which of the following is correct?**

A.  $\phi \subseteq \{a, b\}$

B.  $\phi \in \{a, b\}$

C.  $\{a\} \in \{a, b\}$

D.  $a \subseteq \{a, b\}$

**Answer: A**

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7. If  $A \cup B = A \cap B$ , then

A.  $A \neq B$

B.  $A=B$

C.  $A \subset B$

D.  $B \subset A$

**Answer: B**



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8. If  $B - A$  is  $B$ , then  $A \cap B$  is

A.  $A$

B.  $B$

C.  $U$

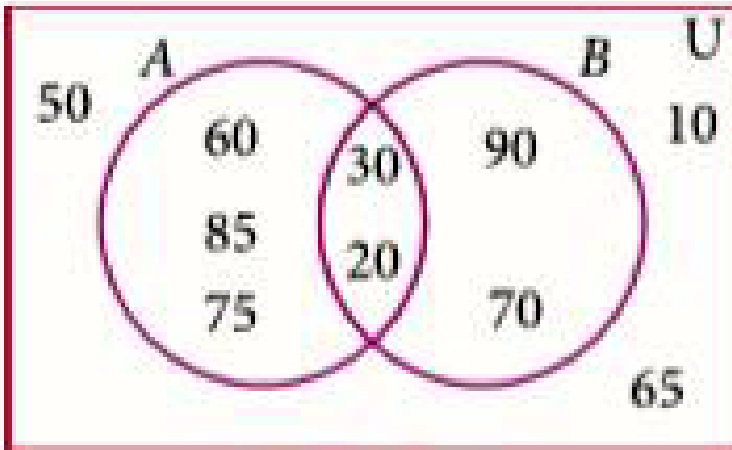
D.  $\phi$

Answer: D



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9. From the adjacent diagram  $n[P(A\Delta B)]$  is



A. 8

B. 16

C. 32

D. 64

**Answer: C**



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10. If  $n(A) = 10$  and  $n(B) = 15$ , then the minimum and maximum number of elements in  $A \cap B$  is

A. 10,15

B. 15,10

C. 10,0

D. 0,10

**Answer: D**



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11. Let  $A = \{\phi\}$  and  $B = P(A)$ , then  $A \cap B$  is



A.  $\{\phi, \{\phi\}\}$

B.  $\{\phi\}$

C.  $\phi$

D.  $\{0\}$

**Answer: B**



**View Text Solution**

**12.** In a class of 50 boys, 35 boys play Carrom and 20 boys play Chess then the number of boys play both games is

A. 5

B. 30

C. 15

D. 10

**Answer: A**

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13. If  
 $u = \{x : x \in \mathbb{N} \text{ and } x < 10\}$ ,  $A = \{1, 2, 3, 5, 8\}$  and  $B = \{2, 5, 6, 7, 9\}$   
 , then  $n|(A \cup B)|$  is

A. 1

B. 2

C. 4

D. 8

**Answer: A**

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14. For any three sets P, Q and R,  $P - (Q \cap R)$  is

A.  $P - (Q \cup R)$

B.  $(P \cap Q) - R$

C.  $(P - Q) \cup (P - R)$

D.  $(P - Q) \cap (P - R)$

**Answer: C**

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15. Which of the following is true?

A.  $A - B = A \cap B$

B.  $A - B = B - A$

C.  $(A \cup B)' = A' \cup B'$

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

**Answer: D**

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16.

If

$$n(A \cup B \cup C) = 100, n(A) = 4x, n(B) = 6x, n(C) = 5x, n(A \cap B) = 20$$

, then the value of  $x$  is

A. 10

B. 15

C. 25

D. 30

**Answer: A**



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17. For any three sets  $A, B$  and  $C$ ,  $(A - B) \cap (B - C)$  is equal to

A.  $A$  only

B.  $B$  only

C.  $C$  only

D.  $\phi$

**Answer: D**



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18.  $J$  = Set of three sided shapes,  $K$  = Set of shapes with two equal sides and  $L$  = Set of shapes with right angle, then  $J \cap K \cap L$  is

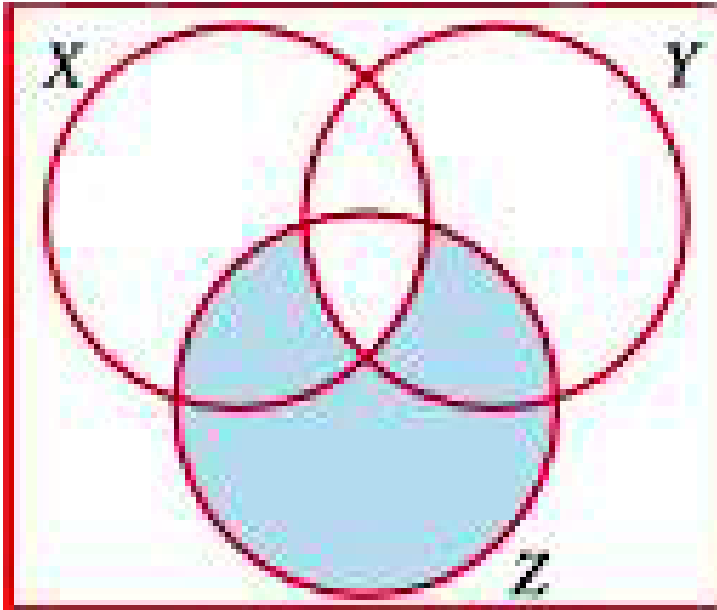
- A. Set of isosceles triangles
- B. Set of equilateral triangles
- C. Set of isosceles right triangles
- D. Set of right angled triangles

**Answer: C**



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19. The shaded region in the Venn diagram is



A.  $Z - (X \cup Y)$

B.  $(X \cup Y) \cap Z$

C.  $Z - (X \cap Y)$

D.  $Z \cup (X \cap Y)$

Answer: C



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20. In a city, 40% people like only one fruit, 35% people like only two fruits, 20% people like all the three fruits. How many percentage of people do not like any one of the above three fruits?

A. 5

B. 8

C. 10

D. 15

**Answer: A**



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