



MATHS

BOOKS - KUMAR PRAKASHAN KENDRA MATHS (GUJRATI ENGLISH)

SETS



1. Which of the following are sets ? Justify your answer.

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



2. Which of the following are sets ? Justify your answer.

The collection of ten most talented writers of India.



3. Which of the following are sets ? Justify your answer.

A team of eleven best-cricket batsmen of the world.

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4. Which of the following are sets ? Justify your answer.

The collection of all boys in your class.

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5. Which of the following are sets ? Justify your answer.

The collection of all natural numbers less than 100.

6. Which of the following are sets ? Justify your answer.

A collection of novels written by the writer Munshi Prem Chand.

| 0 | Watch Video Solution | |
|---|----------------------|--|
| | | |

7. Which of the following are sets ? Justify your answer.

The collection of all even integers.

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8. Which of the following are sets ? Justify your answer.

The collection of questions in this Chapter.



9. Which of the following are sets ? Justify your answer.

A collection of most dangerous animals of the world.



10. Let $A=\{1,2,3,4,5,6\}.$ Insert the appropriate symbol $\ \in \ {
m or} \
ot \in \ {
m in}$

the blank spaces:

5...A

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

the blank spaces:

 $8.\ldots A$

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

the blank spaces:

 $0.\ldots A$

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

 $4.\ldots A$

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

the blank spaces:

 $2.\ldots A$

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15. Let $A=\{1,2,3,4,5,6\}.$ Insert the appropriate symbol $\ \in \ {
m or} \
ot \in \ {
m in}$

the blank spaces:

10...A

16. Write the following sets in roster form:

A = {x : x is an integer and $-3 \le x < 7$ }



19. Write the following sets in roster form:

D = {x : x is a prime number which is divisor of 60}



 $(3, 6, 9, 12\}$

23. Write the following sets in the set-builder form :

 $\{2, 4, 8, 16, 32\}$

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24. Write the following sets in the set-builder form :

 $\{5, 25, 125, 625\}$

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25. Write the following sets in the set-builder form :

 $\{2, 4, 6, \dots\}$

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26. Write the following sets in the set-builder form :

 $\{1, 4, 9, \dots, 100\}$



27. List all the elements of the following sets :

A = {x : x is an odd natural number}

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28. List all the elements of the following sets :

B = {x : x is an integer,
$$-rac{1}{2} < x < rac{9}{2}$$
}

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29. List all the elements of the following sets :

C = {x : x is an integer,
$$x^2 \leq 4$$
}

30. List all the elements of the following sets :

D = {x : x is a letter in the word "LOYAL"}



31. List all the elements of the following sets :

E = {x : x is a month of a year not having 31 days}

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32. List all the elements of the following sets :

F = {x : x is a consonant in the English alphabet which precedes k }.



33. Match each of the set on the left in the roster form with the same set

on the right described in set builder form :

| (i) {1, 2, 3, 6} | (a) {x : x is a prime number and a divisor of 6} |
|--------------------------------|---|
| (ii) {2, 3} | (b) $\{x : x \text{ is an odd natural} $ number less than 10 $\}$ |
| (iii) {M, A, T, H, E, I, C, S} | (c) $\{x : x \text{ is natural number} \\ and divisor of 6\}$ |
| (iv) {1, 3, 5, 7, 9} | (d) {x : x is a letter of the word MATHEMATICS} |

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Exercise 12

1. Which of the following are examples of the null set

Set of odd natural numbers divisible by 2



2. Which of the following are examples of the null set

Set of even prime numbers.

3. Which of the following are examples of the null set

{ x : x is a natural numbers, $x < 5 ext{ and } x > 7$ }



6. Which of the following sets are finite or infinite

 $\{1,2,3,\dots\}$

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7. Which of the following sets are finite or infinite

 $\{1, 2, 3, \dots 99, 100\}$

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8. Which of the following sets are finite or infinite

The set of positive integers greater than 100



9. Which of the following sets are finite or infinite

The set of prime numbers less than 99



10. State whether each of the following set is finite or infinite:

The set of lines which are parallel to the x-axis

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11. State whether each of the following set is finite or infinite:

The set of letters in the English alphabet

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12. State whether each of the following set is finite or infinite:

The set of numbers which are multiple of 5

13. State whether each of the following set is finite or infinite:

The set of animals living on the earth



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15. In the following, state whether A = B or not:

$$A=\{a,b,c,d\}B=\{d,c,b,a\}$$

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16. In the following, state whether A = B or not:

$$A = \{4, 8, 12, 16\}B = \{8, 4, 16, 18\}$$

17. In the following, state whether A = B or not:

 $A = \{2, 4, 6, 8, 10\}$ B = { x : x is positive even integer and $x \leq 10$ }

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18. In the following, state whether A = B or not:

A = { x : x is a multiple of 10}, $B = \{10, 15, 20, 25, 30, \dots\}$

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19. Are the following pair of sets equal ? Give reasons.

$$A=\{2,3\}$$
, B = {x : x is solution of $x^2+5x+6=0\}$

20. Are the following pair of sets equal ? Give reasons.

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

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



21. From the sets given below, select equal sets :

$$A = \{2, 4, 8, 12\}, B = \{1, 2, 3, 4\}, C = \{4, 8, 12, 14\}, D = \{3, 1, 4, 2\}$$

$$E=\{-1,1\},F=\{0,a\},G=\{1,-1\},H=\{0,1\}$$

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Exercise 13

1. Make correct statements by filling in the symbols \subset or $\not\subset$ in the blank spaces :

 $\{2, 3, 4\}$... $\{1, 2, 3, 4, 5\}$



2. Make correct statements by filling in the symbols $\ \subset \ {\rm or} \ \not \subset$ in the blank spaces :

 $\{a,b,c\}.\ldots\{b,c,d\}$

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3. Make correct statements by filling in the symbols $\ \subset \ {\rm or} \ \not\subset$ in the blank spaces :

 $\{x:x \text{ is a student of Class XI of your school}\}$. . . $\{x:x \text{ student of your } x \in X \}$

school}

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4. Make correct statements by filling in the symbols \subset or $\not\subset$ in the blank spaces :

| $\{x:x \text{ is a circle in the plane}\}\ldots \{x:x \text{ is a circle in the same plane with}\}$ |
|--|
| radius 1 unit} |
| |
| Watch Video Solution |
| |
| |
| 5. Make correct statements by filling in the symbols $\ \subset \ \mathrm{or} \ ot \subset$ in the |
| blank spaces : |
| $\{x:x 	ext{ is a triangle in a plane} \dots \{x:x 	ext{ is a rectangle in the plane}\}$ |
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| |
| |
| 6. Make correct statements by filling in the symbols $\ \subset \ \mathrm{or} \ ot \subset$ in the |
| blank spaces : |
| $\{x:x 	ext{ is an equilateral triangle in a plane} \dots \{x:x 	ext{ is a triangle in the}$ |
| same plane} |

7. Make correct statements by filling in the symbols $\ \subset \ {
m or} \
ot \subset \ {
m in}$ the

blank spaces :

 $\{x : x \text{ is an even natural number}\} \dots \{x : x \text{ is an integer}\}$

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|----------------------|--|
| | |

8. Examine whether the following statements are true or false:

 $\{a,b\}
ot\subset \{b,c,a\}$

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9. Examine whether the following statements are true or false:

 $\{a,e\} \subset \{x : x \text{ is a vowel in the English alphabet}\}$



10. Examine whether the following statements are true or false:

 $\{1,2,3\} \subset \{1,3,5\}$

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11. Examine whether the following statements are true or false:

 $\{a\} \subset \{a,b,c\}$

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12. Examine whether the following statements are true or false:

 $\{a\} \subset \{a,b,c\}$



13. Examine whether the following statements are true or false:

{ x:x is an even natural number less than 6} \subset { x:x is a natural





15. Let $A = \{1, 2, \{3, 4\}, 5\}$. Which of the following statements are incorrect and why?

 $\{3,4\}\in A$



16. Let $A = \{1, 2, \{3, 4\}, 5\}$. Which of the following statements are

incorrect and why?

$\{\{3,4\}\}\subset A$



17. Let $A = \{1, 2, \{3, 4\}, 5\}$. Which of the following statements are incorrect and why?

 $1\in A$

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18. Let $A = \{1, 2, \{3, 4\}, 5\}$. Which of the following statements are incorrect and why?

 $1\subset A$



19. Let $A = \{1, 2, \{3, 4\}, 5\}$. Which of the following statements are

incorrect and why?





21. Let $A = \{1, 2, \{3, 4\}, 5\}$. Which of the following statements are incorrect and why?

 $\{1,2,3\}\subset A$



22. Let A= {1, 2, {3, 4}, 5}. Which of the following statemets are incorrect

and why?

 $\phi \in A$



24. Let $A = \{1, 2, \{3, 4\}, 5\}$. Which of the following statements are incorrect and why?

 $\{arphi\}\subset A$



25. Write down all the subsets of the following sets

 $\{a\}$



26. Write down all the subsets of the following sets

 $\{a,b\}$

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27. Write down all the subsets of the following sets

 $\{1, 2, 3\}$

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28. Write down all the subsets of the following sets

 ϕ

29. How many elements has P(A), if $A = \varphi$?



30. Write the following as intervals :

 $\{x : x \in R, -4 < x \leq 6\}$

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31. Write the following as intervals :

 $\{x \colon x \in R, -12 < x < -10\}$

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32. Write the following as intervals :

 $\{x : x \in R, 0 \le x < 7\}$

33. Write the following as intervals :

 $\{x\!:\!x\in R,3\leq x\leq 4\}$



34. Write the following intervals in set-builder form :

(-3, 0)

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35. Write the following interval in set builder form.

(6, 12)

36. Write the following interval in set builder form.

(6, 12)

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37. Write the following interval in set builder form.

(-23, 5)

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38. What universal set(s) would you propose for each of the following :

The set of right triangles.



39. What universal set(s) would you propose for each of the following :

The set of isosceles triangles.



40. Given the sets $A = \{1, 3, 5\}, B = \{2, 4, 6\}$ and $C = \{0, 2, 4, 6, 8\}$, which of the following may be considered as universal set (s) for all the three sets A, B and

 $\{0, 1, 2, 3, 4, 5, 6\}$

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41. Given the sets $A = \{1, 3, 5\}, B = \{2, 4, 6\}$ and $C = \{0, 2, 4, 6, 8\}$, which of the following may be considered as universal set (s) for all the three sets A, B and

 ϕ

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42. Given the sets $A = \{1, 3, 5\}, B = \{2, 4, 6\}$ and $C = \{0, 2, 4, 6, 8\}$,

which of the following may be considered as universal set (s) for all the

three sets A, B and

 $\{0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10\}$

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43. Given the sets $A = \{1, 3, 5\}, B = \{2, 4, 6\}$ and $C = \{0, 2, 4, 6, 8\}$, which of the following may be considered as universal set (s) for all the three sets A, B and $\{1, 2, 3, 4, 5, 6, 7, 8\}$

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1. Find the union of each of the following pairs of sets :

 $X = \{1, 3, 5\}Y = \{1, 2, 3\}$

2. Find the union of each of the following pairs of sets :

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

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3. Find the union of each of the following pairs of sets :

A = $\{x : x \text{ is a natural number and multiple of 3}\}$

B = {x : x is a natural number less than 6}

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4. Find the union of each of the following pairs of sets :

A = {x : x is a natural number and $1 < x \leq 6$ }

B = {x : x is a natural number and 6 < x < 10 }

5. Find the union of each of the following pairs of sets :

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

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6. Let $A = \{a, b\}, B = \{a, b, c\}$. Is $A \subset B$? What is $A \cup B$?

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7. If A and B are two sets such that $A \subset B$ then what is $A \cup B$?

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8.

 $A = \{1, 2, 3, 4\}, B = \{3, 4, 5, 6\}, C = \{5, 6, 7, 8\} \text{ and } D = \{7, 8, 9, 10\}$

, find

 $A\cup B\cup D$



9.

 $A = \{1, 2, 3, 4\}, B = \{3, 4, 5, 6\}, C = \{5, 6, 7, 8\} \text{ and } D = \{7, 8, 9, 10\}$

If

If

, find

 $A\cup C$

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10. If $A = \{1, 2, 3, 4\}, B = \{3, 4, 5, 6\}, C = \{5, 6, 7, 8\}$ and $D = \{7, 8, 9, 10\}$, find $B \cup C$ Watch Video Solution

11.

$$A = \{1, 2, 3, 4\}, B = \{3, 4, 5, 6\}, C = \{5, 6, 7, 8\} \text{ and } D = \{7, 8, 9, 10\}$$

, find

 $B\cup D$



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

, find

 $A\cup B\cup C$

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13.

lf

 $A = \{1, 2, 3, 4\}, B = \{3, 4, 5, 6\}, C = \{5, 6, 7, 8\} \text{ and } D = \{7, 8, 9, 10\}$

, find

 $A\cup B\cup D$

14.

 $A = \{1, 2, 3, 4\}, B = \{3, 4, 5, 6\}, C = \{5, 6, 7, 8\} \text{ and } D = \{7, 8, 9, 10\}$, find

 $B\cup C\cup D$

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15. Find the intersection of each pair of sets of question 1 above.

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16. Find the intersection of each pair of sets of question 1 above.



17. Find the intersection of each pair of sets of question 1 above.
18. Find the intersection of each pair of sets of question 1 above.



, find

 $B\cap C$



22. If
$$A = \{3, 5, 7, 9, 11\}, B = \{7, 9, 11, 13\}, C = \{11, 13, 15\} \text{ and } D = \{15, 17\}$$

, find

 $A\cap C\cap D$

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23.

If

 $A = \{3, 5, 7, 9, 11\}, B = \{7, 9, 11, 13\}, C = \{11, 13, 15\} \text{ and } D = \{15, 17\}$

, find

 $A\cap C$

 $A = \{3, 5, 7, 9, 11\}, B = \{7, 9, 11, 13\}, C = \{11, 13, 15\} \text{ and } D = \{15, 17\}$, find

 $B\cap D$

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25. If
$$A = \{3, 5, 7, 9, 11\}, B = \{7, 9, 11, 13\}, C = \{11, 13, 15\} \text{ and } D = \{15, 17\}$$
, find

 $A\cap (B\cup C)$

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26.

lf

 $A = \{3, 5, 7, 9, 11\}, B = \{7, 9, 11, 13\}, C = \{11, 13, 15\} \text{ and } D = \{15, 17\}$

, find

 $A\cap D$

27.

 $A = \{3, 5, 7, 9, 11\}, B = \{7, 9, 11, 13\}, C = \{11, 13, 15\} \text{ and } D = \{15, 17\}$

, find

 $A\cap (B\cup D)$

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28. If $A = \{3, 5, 7, 9, 11\}, B = \{7, 9, 11, 13\}, C = \{11, 13, 15\}$

and $D = \{15, 17\}$, find $A \cup D, B \cup C, (A \cup D) \cap (B \cup C)$

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29. If $A = \{3, 5, 7, 9, 11\}, B = \{7, 9, 11, 13\}, C = \{11, 13, 15\}$

and $D = \{15, 17\}$, find $A \cup D, B \cup C, (A \cup D) \cap (B \cup C)$

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If

30. Let A={x : x is a natural number}, B ={x : x is an even natural number}

C={x : x is an odd natural number and D={x : x is a prime number}

Find $A \cap B, A \cap C, A \cap D, B \cap C, B \cap D$ and $C \cap D$.



- **31.** If A= {x : x is a natural number},
- B= {x : x is an even natural number},
- C= {x : x is an odd natural number},
- D= {x : x is a prime number}

then find the following sets.

 $A\cap C$

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32. If A = {x : x is a natural number }, B = {x : x is an even natural number} C = {x : x is an odd natural number} and D = {x : x is a prime number }, find **33.** If A = {x : x is a natural number }, B = {x : x is an even natural number} C = {x : x is an odd natural number} and D = {x : x is a prime number }, find $B \cap C$

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34. If A = {x : x is a natural number }, B = {x : x is an even natural number} C = {x : x is an odd natural number} and D = {x : x is a prime number }, find

 $B\cap D$

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35. If A = {x : x is a natural number }, B = {x : x is an even natural number} C = {x : x is an odd natural number} and D = {x : x is a prime number }, find

 $C\cap D$



36. Which of the following pairs of sets are disjoint

 $\{1,\,2,\,3,\,4\}$ and $\{x\,{:}\,x$ is a natural number and $4\leq x\leq 6$ }



37. Which of the following pairs of sets are disjoint

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\{a,e,i,o,u\} and \{c,d,e,f\}
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38. Which of the following pairs of sets are disjoint

 $\{x : x \text{ is an even integer }\}$ and $\{x : x \text{ is an odd integer}\}$

39. If $A = \{3, 6, 9, 12, 15, 18, 21\}, B = \{4, 8, 12, 16, 20\},$ $C = \{2, 4, 6, 8, 10, 12, 14, 16\}, D = \{5, 10, 15, 20\},$ find A - D

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40. If
$$A = \{3, 6, 9, 12, 15, 18, 21\}, B = \{4, 8, 12, 16, 20\},$$

 $C = \{2, 4, 6, 8, 10, 12, 14, 16\}, D = \{5, 10, 15, 20\},$ find $A-C$

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41. If
$$A = \{3, 6, 9, 12, 15, 18, 21\}, B = \{4, 8, 12, 16, 20\},$$

 $C = \{2, 4, 6, 8, 10, 12, 14, 16\}, D = \{5, 10, 15, 20\},$ find $A-D$

42. If $A = \{3, 6, 9, 12, 15, 18, 21\}, B = \{4, 8, 12, 16, 20\},$ $C = \{2, 4, 6, 8, 10, 12, 14, 16\}, D = \{5, 10, 15, 20\},$ find B-A

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43. If
$$A = \{3, 6, 9, 12, 15, 18, 21\}, B = \{4, 8, 12, 16, 20\},$$

 $C = \{2, 4, 6, 8, 10, 12, 14, 16\}, D = \{5, 10, 15, 20\},$ find $C - A$

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44. If
$$A = \{3, 6, 9, 12, 15, 18, 21\}, B = \{4, 8, 12, 16, 20\},$$

 $C = \{2, 4, 6, 8, 10, 12, 14, 16\}, D = \{5, 10, 15, 20\},$ find $D - A$

45. If $A = \{3, 6, 9, 12, 15, 18, 21\}, B = \{4, 8, 12, 16, 20\},$ $C = \{2, 4, 6, 8, 10, 12, 14, 16\}, D = \{5, 10, 15, 20\},$ find B-C

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46. If
$$A = \{3, 6, 9, 12, 15, 18, 21\}, B = \{4, 8, 12, 16, 20\},$$

 $C = \{2, 4, 6, 8, 10, 12, 14, 16\}, D = \{5, 10, 15, 20\},$ find $B-D$

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47. If
$$A = \{3, 6, 9, 12, 15, 18, 21\}, B = \{4, 8, 12, 16, 20\},$$

 $C = \{2, 4, 6, 8, 10, 12, 14, 16\}, D = \{5, 10, 15, 20\},$ find $C-B$

48. If $A = \{3, 6, 9, 12, 15, 18, 21\}, B = \{4, 8, 12, 16, 20\},$ $C = \{2, 4, 6, 8, 10, 12, 14, 16\}, D = \{5, 10, 15, 20\},$ find D-B

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49. If
$$A = \{3, 6, 9, 12, 15, 18, 21\}, B = \{4, 8, 12, 16, 20\},$$

 $C = \{2, 4, 6, 8, 10, 12, 14, 16\}, D = \{5, 10, 15, 20\},$ find $C-D$

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50. If
$$A = \{3, 6, 9, 12, 15, 18, 21\}, B = \{4, 8, 12, 16, 20\},$$

 $C = \{2, 4, 6, 8, 10, 12, 14, 16\}, D = \{5, 10, 15, 20\},$ find $D-C$

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



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

Y - X

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

 $X\cap Y$

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54. If R is the set of real numbers and Q is the set of rational numbers,

then what is R-Q?



55. State whether each of the following statement is true or false. Justify your answer.

 $\{2, 3, 4, 5\}$ and $\{3, 6\}$ are disjoint sets.

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56. State whether each of the following statement is true or false. Justify your answer.

 $\{a,e,i,o,u\} \mbox{ and } \{a,b,c,d\}$ are disjoint sets.

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57. State whether each of the following statement is true or false. Justify

your answer.

 $\{2,\,6,\,10,\,14\}\,$ and $\,\{3,\,7,\,11,\,15\}$ are disjoint sets.

58. State whether each of the following statement is true or false. Justify your answer.

 $\{2,\,6,\,10\}\,$ and $\,\{3,\,7,\,11\}$ are disjoint sets.



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

Find B'

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

and $C = \{3, 4, 5, 6\}$. Find the following sets.

 $A\cup C, (A\cup C)$ ' $= U - (A\cup C)$

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

Find $(A \cup B)$ '

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.

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

 $\mathsf{Find}\;(A\,{}')\,{}'$

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

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7. If $U = \{a, b, c, d, e, f, g, h\}$, find the complements of the following sets :

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

8. If $U = \{a, b, c, d, e, f, g, h\}$, find the complements of the following sets :

 $B=\{d,e,f,g\}$

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9. If $U = \{a, b, c, d, e, f, g, h\}$, find the complements of the following sets :

 $C = \{a,c,e,g\}$

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10. If $U = \{a, b, c, d, e, f, g, h\}$, find the complements of the following sets :

 $D=\{f,g,h,a\}$



complements of the following sets:

 $\{x : x \text{ is a positive multiple of 3}\}$

14. Taking the set of natural numbers as the universal set, write down the

complements of the following sets:

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



15. Taking the set of natural numbers as the universal set, write down the

complements of the following sets:

 $\{x : x \text{ is a natural number divisible by 3 and 5}\}$

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16. Taking the set of natural numbers as the universal set, write down the

complements of the following sets:

{ x : x is a perfect square }

17. Taking the set of natural numbers as the universal set, write down the

complements of the following sets:

 $\{ x : x \text{ is a perfect square } \}$

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18. Taking the set of natural numbers as the universal set, write down the

complements of the following sets:

 ${x:x+5=8}$

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19. Taking the set of natural numbers as the universal set, write down the

complements of the following sets:

 ${x: 2x + 5 = 9}$

20. Taking the set of natural numbers as the universal set, write down the

complements of the following sets:

 $\{x\!:\!x\,\geq\,7\}$



22. If $U = \{1, 2, 3, 4, 5, 6, 7, 8, 9\}, A = \{2, 4, 6, 8\}$ and $B = \{2, 3, 5, 7\}$.

Verify that

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

23. If $U = \{1, 2, 3, 4, 5, 6, 7, 8, 9\}, A = \{2, 4, 6, 8\}$ and $B = \{2, 3, 5, 7\}$.

Verify that

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

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24. Draw appropriate Venn diagram for each of the following :

 $(A\cup B)$ '

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25. Draw appropriate Venn diagram for each of the following :

 $A' \cap B'$



26. Draw appropriate Venn diagram for each of the following :

 $(A\cap B)$ '

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27. Draw appropriate Venn diagram for each of the following :

 $A' \cup B'$

Watch Video Solution

28. Let U be the set of all triangles in a plane. If A is the set of all triangles

with at least one angle different from 60°, what is A'?



29. Fill in the blanks to make each of the following a true statement :

 $A\cup A'=\dots$



30. Fill in the blanks to make each of the following a true statement :



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31. Fill in the blanks to make each of the following a true statement :

 $A\cap A'=\ldots$

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32. Fill in the blanks to make each of the following a true statement :

 $U' \cap A = \dots$



1. If X and Y are two sets such that n(X) = 17, n(Y) = 23 and $n(X \cup Y) = 38$, find $n(X \cap Y)$.

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2. If X and Y are two sets such that $X\cup Y$ has 18 elements, X has 8 elements and Y has 15 elements , how many elements does $X\cap Y$ have?

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3. In a group of 400 people, 250 can speak Hindi and 200 can speak English. How many people can speak both Hindi and English?



4. If S and T are two sets such that S has 21 elements, T has 32 elements,

and $S\cap T$ has 11 elements, how many elements does $S\cup T$ have?



5. If X and Y are two sets such that X has 40 elements, $X \cup Y$ has 60 elements and $X \cap Y$ has 10 elements, how many elements does Y have?

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6. In a group of 70 people, 37 like coffee, 52 like tea and each person likes

at least one of the two drinks. How many people like both coffee and tea?

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7. In a group of 65 people, 40 like cricket, 10 like both cricket and tennis.

How many like tennis only and not cricket? How many like tennis?

| 8. In a committee, 50 people speak French, 20 speak Spanish and 10 speak |
|--|
| both Spanish and French. How many speak at least one of these two |
| languages? |

| Watch Video Solution |
|---|
| Practice Work |
| 1. Which of the following are sets ? Justify your answer. The collection of all the months of a year beginning with the letter J. |
| Watch Video Solution |

2. Which of the following are sets? Justify your answer :

The collection of first five prime minister of India.

3. Which of the following are sets? Justify your answer :

The collection of best cricketer of India.

Watch Video Solution 4. Which of the following are sets? Justify your answer : The collection of all prime numbers. Watch Video Solution 5. Which of the following are sets? Justify your answer : The collection of hard chapter in Maths. Watch Video Solution

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

 $4.\ldots A$



Watch Video Solution

9. $A = \{0, 2, 4, 6, 8, 10\}$. Insert the appropriate symbol \in or \notin in the blank space. $12. \ldots A$ 10. Let $A = \{1, 2, 3, 4, 5, 6\}$. Insert the appropriate symbol \in or $ot\in$ in

the blank spaces:

 $8.\ldots A$

Watch Video Solution

11. $A = \{0, 2, 4, 6, 8, 10\}$. Insert the appropriate symbol \in or otin in

the blank space.

 $-2.\ldots.A$

Watch Video Solution

12. Write the following sets in roster form :

A= { x : x is a prime natural numbers 10 < x < 20 }

13. Write the following sets in roster form :

$$B = ig\{x\!:\! x \in Z, x^2 < 20ig\}$$

Watch Video Solution

14. Write the following sets in roster form :

$$C=\{x\!:\!x\in N,x=2n,n\in N\}$$

Watch Video Solution

15. Write the following sets in roster form :

D= {x : x is integers $x^2 - 9 = 0$ }

Watch Video Solution

16. Write the following sets in roster form :

```
E= {x : x is a positive factor of 18}
```

17. Write the following sets in the set builder form :

$$A = \left\{1, \frac{1}{2}, \frac{1}{3}, \frac{1}{4}, \frac{1}{5}, \dots \right\}$$

Watch Video Solution

18. Write the following sets in the set builder form :

$$B=\{\,-\,2,\ -\,1,0,1,2,3,4\}$$

Watch Video Solution

19. Write the following sets in the set builder form :

$$C = \left\{ rac{1}{2}, rac{2}{5}, rac{3}{10}, rac{4}{17}, rac{5}{26}, rac{6}{37}, rac{7}{50}
ight\}$$

20. Write the following sets in the set builder form :

 $D = \{10, 11, 12, 13, 14, 15\}$



21. Write the following sets in the set builder form :

 $E=\{1,2,5,10\}$

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22. List all the elements of the following sets :

$$A = ig\{x\!:\!x^2 < 10, x \in Zig\}$$

Watch Video Solution

23. List all the elements of the following sets :

B= {x : x is a letter of the word "EQUATION"}

24. List all the elements of the following sets :

C= {x : The solution of $x^2+5x+6=0$ }

Watch Video Solution

25. List all the elements of the following sets :

$$D=\left\{x\!:\!x=rac{n}{n+1}n\in N,n\leq9
ight\}$$

Watch Video Solution

26. List all the elements of the following sets :

$$E=\left\{x\!:\!x=rac{1}{2n-1}n\in N, 1\leq n\leq 5
ight\}.$$

27. Match each of the set on the left in the roster form with the same set

on the right described in set builder form :

| (i) {1, 2, 3, 6} | (a) {x : x is a prime number and a divisor of 6} |
|--------------------------------|---|
| (ii) {2, 3} | (b) $\{x : x \text{ is an odd natural} $ number less than 10 $\}$ |
| (iii) {M, A, T, H, E, I, C, S} | (c) $\{x : x \text{ is natural number} and divisor of 6}$ |
| (iv) {1, 3, 5, 7, 9} | (d) {x : x is a letter of the word MATHEMATICS} |

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28. Which of the following sets are empty sets ?

$$ig\{x\!:\!x\in R, x^2+2=0ig\}$$

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29. Which of the following sets are empty sets ?

$$\{x \colon x \in N, 5 < x < 6\}$$



30. Which of the following sets are empty sets ?

$$ig\{x\!:\!x\in N, x^2=9ig\}$$

Watch Video Solution



```
ig\{x\!:\!x^2-2=0,x\;\;	ext{is a rational number}\;\;ig\}
```



32. Which of the following sets are empty sets ?

{x : x is neither prime nor composite number}.
33. Which of the following sets are finite or infinite :

Set of concentric circle in a plane.



34. Which of the following sets are finite or infinite :

 $\{x \colon x \in R, 0 < x < 1\}$

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35. Which of the following sets are finite or infinite :

The set of odd natural numbers.



36. Which of the following sets are finite or infinite :

 $\{x\!:\!x\in N,\,x<200\}$



37. Which of the following sets are finite or infinite :

 $\{x\!:\!x\,\in\,Z,\,x\,<\,5\}$

Watch Video Solution

38. Are the following pari of sets equal? Give reasons

A= {x : x is a letter in the word LOYAL}

B= { y : y is a letter in the word ALLOY}.

Watch Video Solution

39. Are the following pari of sets equal? Give reasons

$$A=ig\{x\!:\!x\in Z,x^2\leq 8ig\}$$

 $B=ig\{y\!:\!y\in R,y\;\; ext{is a solution of }\;\;y^2-4y+3=0ig\}$

40. Are the following pari of sets equal? Give reasons

A= {x : x is a positive integers solution of $x^2 - 2x - 15 = 0$ }

$$B=\left\{y\!:\!y\in N, y^2=25
ight\}$$

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41. Are the following pair of sets equal? Give reasons

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

 $B=\{q,p,s,r\}.$

Watch Video Solution

42. Are the following pair of sets equal? Give reasons

A= {x : x is a letter in the word REAP}

B= {y : y is a letter in the word ROPE}.

43. From the sets given below, select equal sets.

$$egin{aligned} A &= \{x \colon x \in N, \, x < 3\} \ B &= \{1, 2\} \ C &= \{3, 1\} \ D &= \{x \colon x \in N, \, x \ \ ext{is odd number} \ \ x < 5\} \ E &= \{2, 1\} \ F &= \{1, 3\}. \end{aligned}$$

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45. Using sybols \subset and \swarrow fill in the following blanks :

 $a.\ldots\ldots \{a,b,c\}$







52. Examine whether the following statements are true or false :

 $\{\pi\}\subset N$. Where N is the set of natural number.



53. Examine whether the following statements are true or false :

 $\{x : x \text{ is the collection of all birds}\} \subset \{x : x \text{ is the collection of parrot}\}$

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54. $A = \{a, b, \{c, d\}, e\}$ which of the following statements are correct? $\{a, b, c\} \subset A$

Watch Video Solution

55. $A = \{a, b\{c, d\}, e\}$ which of the following statements are correct?

 $\phi \in A$



56. $A = \{a, b, \{c, d\}, e\}$ which of the following statements are correct? $\{\{c, d\}\} \subset A$

Watch Video Solution

57. $A = \{a, b, \{c, d\}, e\}$ which of the following statements are correct?

 $a \in A$

58. $A=\{a,b,\{c,d\},e\}$ which of the following statements are correct? $\{a,b,e\}\subset A$

59. Write down all the subsets of the following sets :

 $\{0,1\}$

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60. Write down all the subsets of the following sets :

 $\{5, \{5\}\}$

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61. Write down all the subsets of the following sets :

 $\{\phi\}$



62. Write down all the subsets of the following sets

 $\{1, 2, 3\}$





66. Write the following as interval.

 $\{x \colon x \in R, \; -2 < x < 5\}$

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67. Write the following as interval.

 $\{x\!:\!x\in R, 4\leq x<16\}$

Watch Video Solution

68. Write the following interval in set builder form.

(-7, 1)



69. Write the following interval in set builder form.

(0, 10)





70. Write the following interval in set builder form.

(1, 18)

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71. Write the following interval in set builder form.

(0, 8)

Watch Video Solution

72. What universal set would you propose for each of the following :

The set of circles with unit radius.



73. What universal set would you propose for each of the following :

The set of squares.



74. What universal set would you propose for each of the following :

The set of rectangles.

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75. Find the union of each of the following pairs of sets.

$$A = \{2, 4, 6, 8\}, B = \{1, 3, 5\}$$

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76. Find the union of each of the following pairs of sets.

$$A = \{x \colon x = 2n+1, n \in Z\}, B = \{x \colon x = 2n, n \in Z\}$$

77. Find the union of each of the following pairs of sets.

$$A=\{1,2,3,4,5\}, B=\{2,3,5,7\}$$

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78.

 $A = \{1, 2, 3, 4, 5\}, B = \{4, 5, 6, 7, 8\}, C = \{7, 8, 9, 10, 11\}, D = \{10, 11, 12\}, D = \{10, 12\}, D = \{10$

Find the following sets.

 $A\cup B$



79.

$$A = \{1, 2, 3, 4, 5\}, B = \{4, 5, 6, 7, 8\}, C = \{7, 8, 9, 10, 11\}, D = \{10, 11, 12\}, D = \{10, 12$$

Find the following sets.

 $B\cup C$

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80.

 $A = \{1, 2, 3, 4, 5\}, B = \{4, 5, 6, 7, 8\}, C = \{7, 8, 9, 10, 11\}, D = \{10, 11, 12\}, D = \{10, 12\}, D = \{10$

Find the following sets.

 $A\cup B\cup C$

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81.

 $A = \{1, 2, 3, 4, 5\}, B = \{4, 5, 6, 7, 8\}, C = \{7, 8, 9, 10, 11\}, D = \{10, 11, 12\}, D = \{10, 12\}, D =$

Find the following sets.

 $A\cap C$

82.

.

 $A = \{1, 2, 3, 4, 5\}, B = \{4, 5, 6, 7, 8\}, C = \{7, 8, 9, 10, 11\}, D = \{10, 11, 12\}, D = \{10, 12\}, D =$

Find the following sets.

 $A\cup B\cup C$

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83.

•

$$A = \{1, 2, 3, 4, 5\}, B = \{4, 5, 6, 7, 8\}, C = \{7, 8, 9, 10, 11\}, D = \{10, 11, 1\}$$

Find the following sets.

 $A\cap (B\cup D)$

84.

$$A = \{1, 2, 3, 4, 5\}, B = \{4, 5, 6, 7, 8\}, C = \{7, 8, 9, 10, 11\}, D = \{10, 11, 12\}, D = \{10, 12\}, D =$$

Find the following sets.

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

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85.

 $A = \{1, 2, 3, 4, 5\}, B = \{4, 5, 6, 7, 8\}, C = \{7, 8, 9, 10, 11\}, D = \{10, 11, 12\}, D = \{10, 12\}, D =$

Find the following sets.

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

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86. Which of the following pairs of sets are disjoint :

 $\{x \colon x \in N, 1 < x < 5\}$



88. Which of the following pairs of sets are disjoint :

 $\{2, 4, 6, 8, 10\}$ and $\{2, 3, 5, 7, 11\}$

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89. $A = \{1, 2, 3, 4, 5\}, B = \{1, 3, 5, 6\}, C = \{1, 2, 3\}$, then find the following sets.

A - B

90. $A = \{1, 2, 3, 4, 5\}, B = \{1, 3, 5, 6\}, C = \{1, 2, 3\}$, then find the

following sets.

A - C

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91. $A = \{1, 2, 3, 4, 5\}, B = \{1, 3, 5, 6\}, C = \{1, 2, 3\}$, then find the

following sets.

B-C

Watch Video Solution

92. $A = \{1, 2, 3, 4, 5\}, B = \{1, 3, 5, 6\}, C = \{1, 2, 3\}$, then find the

following sets.

A - (B - C)

93. $A = \{1, 2, 3, 4, 5\}, B = \{1, 3, 5, 6\}, C = \{1, 2, 3\}$, then find the following sets.

 $A - (B \cap C)$

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94.

 $A = \{1, 2, 3, 4, 5, 6\}, B = \{7, 8, 9, 10, 11\} \ \text{ and } \ C = \{6, 8, 10, 12, 14\}.$

Show that A and B are disjoint sets but A and C are not disjoint sets.

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95. Let $U = \{2, 4, 6, 8, 10, 12, 14, 16, 18, 20\}, A = \{4, 8, 16, 12\},$ $B = \{1, 2, 3, 4, 5\}, C = \{4, 8, 12, 16, 20\}$ then find the following sets. A' **96.** Let $U = \{2, 4, 6, 8, 10, 12, 14, 16, 18, 20\}$, $A = \{4, 8, 16, 12\}$, $B = \{1, 2, 3, 4, 5\}$, $C = \{4, 8, 12, 16, 20\}$ then find the following sets. B'.



97. Let $U = \{2, 4, 6, 8, 10, 12, 14, 16, 18, 20\}, A = \{4, 8, 16, 12\},$ $B = \{1, 2, 3, 4, 5\}, C = \{4, 8, 12, 16, 20\}$ then find the following sets.

 $(A\cap B)$ '

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98. Let $U = \{2, 4, 6, 8, 10, 12, 14, 16, 18, 20\}$, $A = \{4, 8, 16, 12\}$, B= {1, 2, 3, 4, 5}, $C = \{4, 8, 12, 16, 20\}$ then find the following sets. $(A \cup C)$ ' **99.** Let $U = \{2, 4, 6, 8, 10, 12, 14, 16, 18, 20\}, A = \{4, 8, 16, 12\},$ $B = \{1, 2, 3, 4, 5\}, C = \{4, 8, 12, 16, 20\}$ then find the following sets. (B - C)'

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100. $U = \{h, i, j, k, l, m, n, o, p\}$ then find the complement of the following sets : $A = \{h, k, o, p\}$

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101. $U = \{h, i, j, k, l, m, n, o, p\}$ then find the complement of the

following sets : $B = \{j, k, l, m\}$

102. $U = \{h, i, j, k, l, m, n, o, p\}$ then find the complement of the following sets : $C = \{i, j, l, m, n\}$



103. $U = \{h, i, j, k, l, m, n, o, p\}$ then find the complement of the following sets : $D = \{h, i, j, k, l, m, o, p\}$

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104. Taking the set of natural numbers as the universal set, write down

the complement of the following sets.

 $\{x\!:\!x\in N,x\geq 10\}$



105. Taking the set of natural numbers as the universal set, write down the complement of the following sets.

 ${x: 3x + 2 = 20}$

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106. Taking the set of natural numbers as the universal set, write down the complement of the following sets.

{x : x is a natural number divisible by 2 and 3}



107. Taking the set of natural numbers as the universal set, write down

the complement of the following sets.

{x : x is a prime or composite number}

108. Taking the set of natural numbers as the universal set, write down the complement of the following sets.

{x : x is a multiple of 5}



109.

$$U = \{x \mid x \in N, 1 \leq x \leq 10\}, A = \{1, 3, 5, 7, 9\} \ \ ext{and} \ \ B = \{2, 5, 8\}.$$

Verify the De morgon's Law.

110. Fill in the blanks to make each of the following a true statement :

The number of subsets of a set A having n elements is



111. Fill in the blanks to make each of the following a true statement :

Each set has at least subsets.



112. Fill in the blanks to make each of the following a true statement :

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

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113. Fill in the blanks to make each of the following a true statement :

 $A = \{x : x \in R, x \ge 4\}$ and $\{x : x \in R, x < 5\}$ then

 $A \cap B = \dots$

114. Fill in the blanks to make each of the following a true statement :

$$(A-B)\cup (B-A)=\dots\dots\dots$$

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115. Fill in the blanks to make each of the following a true statement :

 $(A')'\ldots\ldots$

Watch Video Solution

116. In a town, 20% population travel by car, 50% travel by bus and 10% population travel by both car and bus. How many population is travelled by car or bus ?



117. Out of 100 students, 55 passed in Mathematics and 67 passed in Physics 100 students passed at least one of these two subjects. Find how many students passed in Physics only?



118. In a survey of a society, 1000 people speak Gujarati or Hindi. 50% people speak Hindi and 70% speak Gujarati. Find how many percentage of people speak both Gujarati and Hindi.



119. In a school there are 20 teachers who teach mathematics or physics. Of these, 12 teach mathematics and 4 teach both physics and mathematics. How many teach physics ?

120. If A and B be two sets containing 3 and 6 elements respectively. What can be the minimum number of elements in $A \cup B$? Find also, the maximum number of elements in $A \cup B$.



121. In a twon of 840 persons, 450 persons read Hindi 300 read English and 200 read both newspapers. Then find the number of persons who read neither of the newspapers.



122. There are 880 boys in a school. Out of these 224 boys play cricket, 240 boys play hockey and 336 boys play basketball, 64 boys play both hockey and basketball, 80 boys play both cricket and basketball and 40 boys play both cricket and hockey. If 24 boys play all these three, then find the number of boys play none of these three game.

123. A students has freedom to study any subject of his choice. In a group of students with number 1 to 300, the students whose number is divisible by 3 select arts faculty. The students whose number divisible by 5 select commerce faculty and the students whose number is divisible by 10 select science faculty. Find the number of students who select only one faculty.

Watch Video Solution

124. In a class of 30 students, 12 students like emboidary, 16 students like physics and 18 student like history. If all students select at least one subject and none of them select all the subject then find the number of students select 2 subject.

Watch Video Solution

125. A and B are two sets. $(A-B)\cup B=A$ if and only if $B\subset A.$



1. Decide, among the following sets, which sets are subsets of one and another:

A = {
$$x : x \in R ext{ and } x ext{ satisfy } x^2 ext{--} 8x + 12 = 0$$
 },

 $B = \{2, 4, 6\}, C = \{2, 4, 6, 8, \dots\}, D = \{6\}.$

2. In each of the following, determine whether the statement is true or false. If it is true, prove it. If it is false, give an example. If $x \in A$ and $A \not\subset B$, then $x \in B$



```
If A \subset B \, 	ext{ and } \, B \in C , then A \in C
```



4. In each of the following, determine whether the statement is true or

false. If it is true, prove it. If it is false, give an example.

If $A \subset B \, ext{ and } \, B \subset C$, then $A \subset C$

5. In each of the following, determine whether the statement is true or false. If it is true, prove it. If it is false, give an example.

If $A \not\subset B$ and $B \not\subset C$, then $A \not\subset C$



6. In each of the following, determine whether the statement is true or false. If it is true, prove it. If it is false, give an example.

```
If x \in A \; 	ext{and} \; A 
ot \subset B , then x \in B
```

Watch Video Solution

7. In each of the following, determine whether the statement is true or

false. If it is true, prove it. If it is false, give an example.

If $A \subset B ext{ and } x
ot \in B$, then $x
ot \in A$



8. Let A, B, and C be the sets such that $A \cup B = A \cup C$ and $A \cap B = A \cap C$. Show that B = C. Watch Video Solution

9. A is the set of prime number less than 10, B is the set of odd numbers less than 10 and C is the set of even numbers of less than 10. Which of the following statements are true?

(i) $A \subset B$ (ii) $B \subset A$ (iii) $A \subset C$ (iv) $C \subset A$ (v) $B \subset C$ (vi) $\phi \subset A$

Watch Video Solution

10. Show that if $A \subset B$, then $C - B \subset C - A$.

Watch Video Solution

11. Assume that P(A) = P(B). Show that A = B



12. Is it true that for any sets A and $B, P(A) \cup P(B) = P(A \cup B)$?

Justify your answer.

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13. Show that for any sets A and B,

$$A = (A \cap B) \cup (A ext{-} B) ext{ and } A \cup (B ext{-} A) = (A \cup B)$$

Watch Video Solution

14. Using properties of sets, show that

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

15. Using properties of sets, show that

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



16. Show that $A \cap B = A \cap C$ need not imply B = C.

Watch Video Solution

17. Let A and B be sets. If $A \cap X = B \cap X = arphi$ and $A \cup X = B \cup X$ for

some set X, show that A = B.

Watch Video Solution

18. Find sets A, B and C such that $A\cap B, B\cap C$ and $A\cap C$ are non-

empty sets and $A \cap B \cap C = \varphi$.
19. In a survey of 600 students in a school, 150 students were found to be taking tea and 225 taking coffee, 100 were taking both tea and coffee. Find how many students were taking neither tea nor coffee?

Watch Video Solution

20. In a group of students, 100 students know Hindi, 50 know English and 25 know both. Each of the students knows either Hindi or English. How many students are there in the group?

Watch Video Solution

21. In a survey of 60 people, it was found that 25 people read newspaper H, 26 read newspaper T, 26 read newspaper I, 9 read both H and I, 11 read both H and T, 8 read both T and I, 3 read all three newspapers. Find: the number of people who read at least one of the newspapers.

22. In a survey of 60 people, it was found that 25 people read newspaper H, 26 read newspaper T, 26 read newspaper I, 9 read both H and I, 11 read both H and T, 8 read both T and I, 3 read all three newspapers. Find: the number of people who read exactly one newspaper.

Watch Video Solution

23. In a survey it was found that 21 people liked product A, 26 liked product B and 29 liked product C. If 14 people liked products A and B, 12 people liked products C and A, 14 people liked products B and C and 8 liked all the three products. Find how many liked product C only.



Textbook Based Mcqs

| 1. | Α | and | В | are | not | singleton | sets. | n(A	imes B)=21. | lf |
|----|-------------|------|-----|--------|-----|-----------|-------|-----------------|----|
| A | $\subset B$ | then | n(E | B) = . | | ••• | | | |
| | A. 3 | | | | | | | | |
| | B. 7 | | | | | | | | |
| | C. 21 | | | | | | | | |
| | D. 1 | | | | | | | | |
| | | | | | | | | | |

Answer: B

2.
$$A = \{x : x \in Z, x \text{ is a solution of } x^4 - 16 = 0\}$$
 then
 $A = \dots$
A. $\{-2, 2\}$
B. $\{2\}$
C. $\{-4\}$

D.
$$\{-4, 4, -2, 2\}$$

Answer: A



3. If $B=\{\phi\}$ then,

A. B is an empty set

B. B is a finite set

C. B is an infinite set

D. B is not a set

Answer: B



4. For real number R out of the following, which is not correct?

A. $N\subset R$

 $\mathsf{B.}\,(a,b) \subset R, a < b$

 $\mathsf{C}.\,\pi\subset R$

D. $\phi \subset R$

Answer: C

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5. $A = \{1, 2, 3, 4\}, B = \{-1, 1, 0, -2, 2\}, C = \{1, 3, 4\}$ are subset of which set?

A. (1, 4)

 $\mathsf{B}.\,[\,-\,1,\,4]$

C.(-2,2)

D. (-2, 4)

Answer: B

6. The number of elements in the power set of $ig\{x\!:\!x\in N, x^2<9ig\}$ is.....

- A. 9
- B. 4
- C. 1
- D. 8

Answer: B

Watch Video Solution

7. If $A \subset B$ then $A \cap B =$

A. $A\cap B=\phi$

 $\mathsf{B}.\,A\cap B=A$

 $\mathsf{C}.\,A\cap B=B$

 $\mathsf{D}.\, A\cup B=A$

Answer: B





Answer: A

9. Taking the set of natural number as universal set and $A = \{x : x - 8 = 3\}$ then $A' = \dots$

$\mathsf{A.}\,N$

B. $\{5\}$

 $C. N - \{5\}$

 $D. N - \{11\}$

Answer: D

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10. If $n(U) = 700, n(A) = 200, n(B) = 300, n(A \cap B) = 100$

then $n(A' \cap B') = \ldots \ldots$

A. 400

B. 600

C. 300

D. 200

Answer: C



11. If
$$N_a = \{an \colon n \in N\}$$
, then $N_5 \cap N_7 = \ldots \ldots$

A. N_7

 $\mathsf{B.}\,N_5$

C. N_{35}

D. N_{12}

Answer: C



12. If $aN = \{ax : x \in N\}$ then $3N \cap 7N = \dots$

A. 21N

 ${\rm B.}\,10N$

 $\mathsf{C.}\,4N$

D. none of these

Answer: A

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13. For set $ig\{(a,b)\!:\!2a^2+3b^2=35,a,b\in Zig\}$ the number of its elements is.....

A. 2

B. 4

C. 8

D. 12

Answer: C

14. A and B are two sets $(A-B) \cup (B-A) \cup (A \cap B) = \dots \dots$

A. $A\cup B$

 $\mathsf{B}.\,A\cap B$

 $\mathsf{C}.\,A$

 $\mathsf{D}.\,B^{\,\prime}$

Answer: A

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15. $U=\{x\,:\,x\in N,\,x\leq 10\},\,A=\{1,\,3,\,5,\,7,\,9\},\,B=\{2,\,4,\,6,\,8,\,10\}$ then $(A\cup B)$ '=.....

A. U

B. {2}

 $\mathsf{C}.\phi$

D. $\{1, 4, 7, 8\}$

Answer: C



16.
$$A = \left\{ x \colon x \in N, x^2 + 4 = 0
ight\}$$
 then,

A.
$$A=\{-2,2\}$$

 $\mathsf{B}.\, A=\{2\}$

$$\mathsf{C}.\, A = \phi$$

 $\mathsf{D}.\, A = \{\phi\}$

Answer: C

17. For interval (-1,1) which of the following statements is true?

 $egin{aligned} \mathsf{A}.-1 \in (\,-1,\,1) \ \mathsf{B}.\,0 \in (\,-1,\,1) \ \mathsf{C}.\,(\,-1,\,1) = (\,-1,\,1) \ \mathsf{D}.\,(\,-1,\,1) = \{\phi\} \end{aligned}$

Answer: B

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18. If $A = \{1, 3, 5, \{2, 4\}\}$ and $B = \{2, 4\}$ then,

- A. $4 \in A$
- $\mathsf{B}.\left\{4\right\}\subset A$

 $\mathsf{C}.\,B\subset A$

D. none of these

Answer: D



19. Fill in the blanks to make each of the following a true statement :

 $(A-B)\cup (B-A)=\dots\dots\dots$

- A. $(A-B)\cup A$
- $\mathsf{B.}\,(B-A)\cup B$
- $\mathsf{C}.\,(A\cup B)-(A\cap B)$
- $\mathsf{D}.\,(A\cup B)\cap (A\cap B)$

Answer: C

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20. Which of the following statements is false ?

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

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

Answer: C



21. A and B are mutually disjoint sets. Then $n(A \cup B) = \dots \dots$

A.
$$n(A) + n(B)$$

$${\tt B}.\, n(A) + (n(B) - n(A \cap B)$$

$$\mathsf{C}.\, n(A)+n(B)+n(A\cap B)$$

$$\mathsf{D}.\,n(A)-n(B)$$

Answer: A

22. Two finite sets have m and n elements. The number of elements in the power set of first set is 48 more than the total number of elements in power set of the second set. Then the value of m and n are......

A. 7, 6

B. 6, 3

C. 6, 4

D.7, 4

Answer: C



$$\mathsf{B}.\,(A-B)\cap(A-C)$$

$$\mathsf{C}.\,(B-A)\cup(C-A)$$

D. none of these

Answer: A

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24. 63% of the Americans like cheese where as 76% like apples. If x% of the Americans like both cheese and apples then......

A. x = 39

 $\mathsf{B.}\,x=63$

C. $39 \leq x \leq 63$

D. none of these

Answer: C



A. 26

B. 50

C. 24

D. none of these

Answer: D

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. Then

A. $B\subset A$ B. $A\subset B$ C. $A\cap B=\phi$

D. $A \swarrow B$ and $B \swarrow A$

Answer: B

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2. Let $S = \{x \in R : x \ge 0 \text{ and } 2|\sqrt{x} - 3| + \sqrt{x}(\sqrt{x} - 6) + 6 = 0\}.$ Then $S : \ldots \ldots$

A. is an empty set

B. has only one element

C. has only two element

D. has only four element



4. Write the set
$$\left\{\frac{1}{2}, \frac{2}{3}, \frac{3}{4}, \frac{4}{5}, \frac{5}{6}, \frac{6}{7}\right\}$$
 in the set-builder form.

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5. Match each of the set on the left described in the roster form with the

same set on the right described in the set builder form :

| (i) {P, R, I, N, C, A, L} | (a) {x : x is a positive integer and is a divisor of 18} |
|---------------------------|---|
| (ii) { 0 } | (b) $\{x : x \text{ is an integer and } x^2 - 9 = 0\}$ |
| (iii) {1, 2, 3, 6, 9, 18} | (c) $\{x : x \text{ is an integer and } x + 1 = 1\}$ |
| (iv) {3, -3} | (d) $\{x : x \text{ is a letter of the word PRINCIPAL}\}$ |

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6. State which of the following sets are finite or infinite.

(i) $\{x\!:\!x\in N ext{ and } (x-1)(x-2)=0\}$ (ii) $\{x\!:\!x\in N ext{ and } x^2=4\}$

(iii) $\{x\!:\!x\in N\,\, ext{and}\,\,2x-2=0\}$ (iv) $\{x\!:\!x\in N\,\, ext{ is prime}\}$

 $\text{(v)} \ \{x \mathop{:} x \in N \ \text{and} \quad \text{x is odd} \} \\$

7. State which of the following sets are finite or infinite :

$$ig\{x\!:\!x\in N \;\; ext{and}\;\; x^2=4ig\}$$

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8. State which of the following sets are finite or infinite :

$$\{x : x \in N \;\; ext{and} \;\; 2x - 1 = 0\}$$

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9. State which of the following sets are finite or infinite :

 $\{x : x \in N ext{ and } x ext{ is prime}\}$

10. State which of the following sets are finite or infinite :

 $\{x : x \in N \text{ and } x \text{ is odd}\}$



11. Find the pairs of equal sets, if any, give reasons:

$$A = \{0\}, B = \{x : x > 15 \text{ and } x < 5\},$$

$$C=\{x\!:\!x\!-\!5=0\}, D=ig\{x\!:\!x^2=25ig\},$$

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

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12. Which of the following pairs of sets are equal? Justify your answer.

(i) X, the set of letters in "ALLOY" and B, the set of letters in "LOYAL".

(ii)

$$A = ig\{n\!:\! n \in Z \, ext{ and } \, n^2 \leq 4ig\} \, ext{ and } \, B = ig\{x\!:\! x \in R \, ext{ and } \, x^2\!-\!3x + 2 = 0ig\}$$

13. Which of the following pairs of sets are equal? Justify your answer.(i) X, the set of letters in "ALLOY" and B, the set of letters in "LOYAL".(ii)

$$A = ig\{n\!:\! n \in Z \, ext{ and } n^2 \leq 4ig\} \, ext{ and } B = ig\{x\!:\! x \in R \, ext{ and } x^2\!\!-\!3x + 2 = 0ig\}$$

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14. Consider the sets ϕ , $A = \{1, 3\}$, $B = \{1, 5, 9\}$, $C = \{1, 3, 5, 7, 9\}$. Insert the symbol \subset or \swarrow between each of the following pair of sets. (i) ϕ B (ii) A....B (iii) A....C (iv) B....C

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15. Consider the sets ϕ , $A = \{1, 3\}$, $B = \{1, 5, 9\}$, $C = \{1, 3, 5, 7, 9\}$. Insert the symbol \subset or \checkmark between each of the following pair of sets. (i) ϕ B (ii) A....B (iii) A....C (iv) B....C



16. Consider the sets ϕ , $A = \{1, 3\}$, $B = \{1, 5, 9\}$, $C = \{1, 3, 5, 7, 9\}$. Insert the symbol \subset or \swarrow between each of the following pair of sets. (i) ϕ B (ii) A....B (iii) A....C (iv) B....C

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17. Consider the sets ϕ , $A = \{1, 3\}$, $B = \{1, 5, 9\}$, $C = \{1, 3, 5, 7, 9\}$. Insert the symbol \subset or \swarrow between each of the following pair of sets. (i) ϕ B (ii) A....B (iii) A....C (iv) B....C

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18. Let $A = \{a, e, i, o, u\}$ and $B = \{a, b, c, d\}$. Is A a subset of B ? No.

(Why?). Is B a subset of A? No. (Why?)

19. Let A, B and C be three sets. If $A \in B$ and $B \subset C$, is it true that

 $A \subset C$?. If not, give an example.

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20. Let $A = \{2, 4, 6, 8\}$ and $B = \{6, 8, 10, 12\}$. Find $A \cup B$.

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21. Let $A = \{a, e, i, o, u\}$ and $B = \{a, i, u\}$. Show that $A \cup B = A$



22. Let X = {Ram, Geeta, Akbar} be the set of students of Class XI, who are

in school hockey team. Let Y = {Geeta, David, Ashok} be the set of students



and hence show that $A \cap B = B$.

26. Let $A = \{1, 2, 3, 4, 5, 6\}, B = \{2, 4, 6, 8\}$. Find A - B and B - A.



27. Let $V = \{a, e, i, o, u\}$ and $B = \{a, i, k, u\}$. Find V - B and B - V

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28. Let $U = \{1, 2, 3, 4, 5, 6, 7, 8, 9, 10\}$ and $A = \{1, 3, 5, 7, 9\}$. Find A'.

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29. Let U be universal set of all the students of Class XI of a coeducational

school and A be the set of all girls in Class XI. Find A'.

30. Let $U = \{1, 2, 3, 4, 5, 6\}$, $A = \{2, 3\}$ and $B = \{3, 4, 5\}$. Find $A', B', A' \cap B', A \cup B$ and hence show that $(A \cup B)' = A' \cap B'$.

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31. If X and Y are two sets such that $X\cup Y$ has 50 elements, X has 28 elements and Y has 32 elements, how many elements does $X\cap Y$ have ?

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32. In a school there are 20 teachers who teach mathematics or physics.

Of these, 12 teach mathematics and 4 teach both physics and

mathematics. How many teach physics ?



33. In a class of 35 students, 24 like to play cricket and 16 like to play football. Also, each student likes to play at least one of the two games. How many students like to play both cricket and football ?



34. In a survey of 400 students in a school, 100 were listed as taking apple juice, 150 as taking orange juice and 75 were listed as taking both apple as well as orange juice. Find how many students were taking neither apple juice nor orange juice.



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

- (ii) Chemical C_2 but not chemical C_1
- (iii) Chemical C_1 or chemical C_2

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

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



41. For any sets A and B, show that

 $P(A \cap B) = P(A) \cap P(B).$

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42. A market research group conducted a survey of 1000 consumers and reported that 720 consumers like product A and 450 consumers like product B, what is the least number that must have liked both products?

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43. 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?



44. A college awarded 38 medals in football, 15 in basketball and 20 in cricket. If these medals went to a total of 58 men and only three men got medals in all the three sports, how many received medals in exactly two of the three sports ?

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Solutions Of Ncert Exemplar Problems Short Answer Type Questions

1. Write the following sets in the roaster form.

$$A = \{x \colon \! x \in R, 2x + 11 = 15\}$$

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2. Write the following sets in the roaster form.

$$B=ig\{x\mid x^2=x,x\in Rig\}$$

3. Write the following sets in the roaster form.

 $C = \{x \mid x \text{ is a positive factor of a prime number p}\}$



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5. Write the following sets in the roaster from.

$$E=\{w\}rac{w-2}{w+3}=3,w\in Rigg\}$$

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6. Write the following sets in the roaster from.

$$F=ig\{x/x^4-5x^2+6=0, x\in Rig\}$$



9. State which of the following statements are true and which are false.

Justify your answer.

 $128 \in \{y| ext{ the sum of all the positive factors of y is 2y}.$


10. State which of the following statements are true and which are false.

Justify your answer.

$$3\in ig\{x\mid x^4-5x^3+2x^2-112x+6=0ig\}$$



11. State which of the following statements are true and which are false. Justify your answer.

 $496 \in \{y | \text{ the sum of all the positive factors of y is 2y} \}.$

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12. If L= {1, 2, 3, 4}, M= {3, 4, 5, 6} and N= {1, 3, 5}, then verify that $L - (M \cup N) = (L - M) \cap (L - N).$

13. If A and B are subsets of the universal set $\,\cup$, then show that,

 $A\subset A\cup B$



14. If A and B are subsets of the universal set $\ \cup$, then show that,

 $A\subset B \Leftrightarrow A\cup B=B$

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15. If A and B are subsets of the universal set $\,\cup$, then show that,

 $(A\cap B)\subset A$

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16. Given that N= {1, 2, 3, 4,...., 100}. Then, write

The subset of N whose elements are even numbers.



17. Given that N= {1, 2, 3, 4,...., 100}. Then, write

The subset of N whose elements are perfect square numbers.

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18. If X= {1, 2, 3}, if n represents any member of X, write the following sets

containing numbers represented by

4n

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19. If $X = \{1, 2, 3\}$, if n represents any member of X, write the following sets

containing numbers represented by

n+6

20. If X= {1, 2, 3}, if n represents any member of X, write the following sets

containing numbers represented by

n/2

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21. If X= {1, 2, 3}, if n represents any member of X, write the following sets containing numbers represented by

n-1

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22. If $Y = \{1, 2, 3, \dots, 10\}$ and a represents any element of Y, write the following sets, containing all the elements satisfying the given conditions.

 $a\in Y \;\; ext{but}\;\; a^2
ot\in Y$

23. If $Y=\{1, 2, 3, \dots, 10\}$ and a represents any element of Y, write the following sets, containing all the elements satisfying the given conditions.

 $a+1=6, a\in Y$

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24. If Y= {1, 2, 3,.....,10} and a represents any element of Y, write the following sets, containing all the elements satisfying the given conditions.

a is less than 6 and $a \in Y$

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25. A, B and C are subset of universal set \cup . If A= {2, 4, 6, 8, 12, 20}, B= {3, 6, 12, 15} and C= {5, 10, 15, 20} and \cup is the set of all whole numbers, draw a Venn diagram showing the relation of \cup , A, B and C.

26. Let \cup be the set of all boys and girls in a school, G be the set of all girls in the school, B be the set of all boys in the school and S be the set of all students in the school who take swimming. Some but not all, students in the school take swimming. Draw a Venn diagram showing one of the possible inter relationship among sets \cup , G, B and S.



27.
$$A - (B \cap C) = (A - B) \cap (A - C)$$
 .

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28. For all sets A and B, $(A - B) \cup (A \cap B) = A$.



33. For all sets A and B, $A \cup (B - A) = A \cup B$.



Solutions Of Ncert Exemplar Problems Long Answer Type Questions



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2. Out of 100 students, 55 passed in Mathematics and 67 passed in Physics 100 students passed at least one of these two subjects. Find how many students passed in Physics only?

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3. Out of 100 students, 15 passed in English, 12 passed in Mathematics, 7 in Mathematics and Science, 4 in English and Science, 4 in all the three.

Find how many passed.

In Mathematics and Science but not in English.

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4. Out of 100 students, 15 passed in English, 12 passed in Mathematics, 7 in Mathematics and Science, 4 in English and Science, 4 in all the three. Find how many passed.

In Mathematics only.

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5. Out of 100 students, 15 passed in English, 12 passed in Mathematics, 7 in Mathematics and Science, 4 in English and Science, 4 in all the three. Find how many passed.

In more than one subject only.

6. In a class of 60 students, 25 students play cricket and 20 students play tennis and 10 students play both the games. Find the number of students who play neither.



7. In a survey of 200 students of a school, it was found that 120 study Mathematics, 90 study Physics and 70 study Chemistry, 40 study Mathematics and Physics, 30 study Physics and Chemistry, 50 study Chemistry and Mathematics and 20 none of these subjects. Find the number of students who study all the three subjects.

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8. In a town of 10000 families, it was found that 40% families buy newspaper A, 20% families buy newspaper B, 10% families buy newspaper C, 5% families buy A and B, 3% buy B and C and 4% Buy A and C. If 2%

families buy all the three newspaper. Find

The number of families which buy newspaper A only.

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9. In a town of 10000 families, it was found that 40% families buy newspaper A, 20% families buy newspaper B, 10% families buy newspaper C, 5% families buy A and B, 3% buy B and C and 4% Buy A and C. If 2% families buy all the three newspaper. Find

The number of families which buy none of A, B and C.

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10. In a group of 50 students, the number of students studying French, English, Sanskrit were found to be as follows French = 17, English = 13, Sanskrit = 15, French and Sanskrit = 5, English, French and Sanskrit = 3. Find the number of students who study

Only French.



11. In a group of 50 students, the number of students studying French, English, Sanskrit were found to be as follows French = 17, English = 13, Sanskrit = 15, French and English = 9, English and Sanskrit =4, French and Sanskrit = 5, English, French and Sanskrit = 3. Find the number of students who study

Only English.

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12. In a group of 50 students, the number of students studying French, English, Sanskrit were found to be as follows French = 17, English = 13, Sanskrit = 15, French and English = 9, English and Sanskrit = 4, French and Sanskrit = 5, English, French and Sanskrit = 3. Find the number of students who study

Only Sanskrit.

13. In a group of 50 students, the number of students studying French, English, Sanskrit were found to be as follows French = 17, English = 13, Sanskrit = 15, French and English = 9, English and Sanskrit = 4 French and Sanskrit = 5, English, French and Sanskrit = 3. Find the number of students who study

English and Sanskrit but not French.



14. In a group of 50 students, the number of students studying French,English, Sanskrit were found to be as follows French = 17, English = 13,Sanskrit = 15, French and Sanskrit = 5, English, French and Sanskrit = 3.Find the number of students who studyFrench and Sanskrit but not English.



15. In a group of 50 students, the number of students studying French, English, Sanskrit were found to be as follows French = 17, English = 13, Sanskrit = 15, French and Sanskrit = 5, English, French and Sanskrit = 3. Find the number of students who study

French and English but not Sanskrit.

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16. In a group of 50 students, the number of students studying French,English, Sanskrit were found to be as follows French = 17, English = 13,Sanskrit = 15, French and Sanskrit = 5, English, French and Sanskrit = 3.Find the number of students who study

At least one of the three languages.

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17. In a group of 50 students, the number of students studying French,English, Sanskrit were found to be as follows French = 17, English = 13,

Sanskrit = 15, French and Sanskrit = 5, English, French and Sanskrit = 3.

Find the number of students who study

None of the three languages.

Solutions Of Ncert Exemplar Problems Objective Type Questions

1. Let
$$a_n$$
 be the nth term of an AP, if $\sum_{r=1}^{100}a_{2r}=lpha$ and $\sum_{r=1}^{100}a_{2r-1}=eta$,

then the common difference of the AP is

 $A.\,15$

 $\mathsf{B.9}$

C. 45

D. 35

Answer: C

2. Two finite sets have m and n elements. The number of subsets of the first set is 112 more than of the second set. The values of m and n are, respectively.

A. 4 and 7

B. 7 and 4

C. 4 and 4

D. 7 and 7

Answer: B

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3. The set $(A \cap B')' \cup (B \cap C)$ is equal to

A. $A' \cup B \cup C$

 $\mathsf{B.}\,A\,{'}\,\cup\,B$

 $\mathsf{C}.\,A\,{'}\cup C\,{'}$

 $\mathsf{D}.\,A\,{'}\,\cap\,C$

Answer: B

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4. Let F_1 be the set of parallelograms, F_2 the set of rectangles, F_3 the set of rhombuses, F_4 the set of squares and F_5 the set of trapeziums in a plane. Then, F_1 may be equal to

A. $F_2\cap F_3$

B. $F_3 \cap F_4$

C. $F_2 \cup F_5$

D. $F_1 \cup F_2 \cup F_3 \cup F_4$

Answer: D

5. Let S= set of points inside the square, T= set of points inside the triangle and C= set of points inside the circle. If the triangle and circle intersect each other and are contained in a square. Then,

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

 $\mathsf{B}.\,S\cup T\cup C=C$

 $\mathsf{C}.\,S\cup T\cup C=S$

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

Answer: C

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6. If 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,

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

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

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

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

Answer: D

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7. In a twon of 840 persons, 450 persons read Hindi 300 read English and 200 read both newspapers. Then find the number of persons who read neither of the newspapers.

A. 210

 $\mathsf{B.}\,290$

C. 180

 $\mathsf{D.}\,260$

Answer: B



8. If $X = \{8^n - 7n - 1/n \in N\}$ and $Y = \{49n - 49/n \in N\}$. Then,

A. $X\subset Y$

 $\mathsf{B}.\,Y\subset X$

- $\mathsf{C}.\, X=Y$
- $\mathsf{D}.\, X\cap Y=\phi$

Answer: A

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9. A survey shows that 63% of the people watch a news channel where as 76% watch another channel. If x% of the people watch both channel then,

A.
$$x=35$$

 $\mathsf{B.}\,x=63$

C. $39 \leq x \leq 63$

 $\mathsf{D.}\,x=39$

Answer: C



10. If sets A and B are defined as
$$A = \left\{ (x,y) \mid y = \frac{1}{x}, x \neq 0 \in R \right\}, B = \{ (x,y) \mid y = -x, x \in R \}.$$

Then,

A. $A \cap B = A$ B. $A \cap B = B$ C. $A \cap B = \phi$ D. $A \cup B = A$

Answer: C

11. If A and B are two sets, then $A \cap (A \cup B)$ equals to,

A. A

 $\mathsf{B}.\,B$

 $\mathsf{C}.\phi$

 $\mathsf{D}.\,A\cap B$

Answer: A

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12. If A= {1, 3, 5, 7, 9, 11, 13, 15, 17}, B= {2, 4, 6, 8,..........18} and N the set of natural numbers is the universal set, then $\{A' \cup (A \cup B) \cap B'\}$ is

A. ϕ

 $\mathsf{B}.\,N$

 $\mathsf{C}.\,A$

Answer: B



13. If $S=\{x\mid x ext{ is a positive multiple of 3 less than 100} ext{ and } P=\{x\mid x ext{ is a prime number less than 20} ext{ then } n(S)+n(P) ext{ is equal to}$

A. 34

 $B.\,31$

C. 33

D. 41

Answer: D

14. If X and Y are two sets and X' denotes the complement of X, then $X \cap (X \cup Y)$ ' is equal to

A. X

 $\mathsf{B}.\,Y$

 $\mathsf{C}.\phi$

 $\mathsf{D}.\, X\cap Y$

Answer: C

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Solutions Of Ncert Exemplar Problems Fillers

1. The set $\{x \in R \colon 1 \leq x < 2\}$ can be written as $\ldots \ldots \ldots$



which of the following may be considered as universal set (s) for all the

three sets A, B and

 ϕ

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7. If U= {1, 2, 3, 4, 5, 6, 7, 8, 9, 10}, A= {1, 2, 3, 5}, B= {2, 4, 6, 7} and C= {2, 3, 4, 8}.

Then,

 $(B\cup C)$ ' =

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8. If U= {1, 2, 3, 4, 5, 6, 7, 8, 9, 10}, A= {1, 2, 3, 5}, B= {2, 4, 6, 7} and C= {2, 3, 4, 8}.

Then,

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9. For all sets A and B, $A-(A\cap B)=A-B.$

10. Match the following sets for all sets A, B and C.

| Column I | Column II |
|---|--|
| (i) $((A' \cup B') - A)'$ | (a) A – B |
| (ii) $\left[(\mathbf{B}' \cup (\mathbf{B}' - \mathbf{A}) \right]'$ | (b) A |
| (iii) (A – B) – (B – C) | (c) B |
| (iv) $(\mathbf{A} - \mathbf{B}) \cap (\mathbf{C} - \mathbf{B})$ | (d) $(\mathbf{A} \times \mathbf{B}) \cap (\mathbf{A} \times \mathbf{C})$ |
| (v) $\mathbf{A} \times (\mathbf{B} \cap \mathbf{C})$ | (e) $(\mathbf{A} \times \mathbf{B}) \cup (\mathbf{A} \times \mathbf{C})$ |
| (vi) $\mathbf{A} \times (\mathbf{B} \cup \mathbf{C})$ | (f) $(\mathbf{A} \cap \mathbf{B}) - \mathbf{B}$ |

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Solutions Of Ncert Exemplar Problems True False

1. If A is any set, then $A \subset A$





3. The sets {1, 2, 3, 4} and {3, 4, 5, 6} are equal.



4. $Q \cup Z = Q$, where Q is the set of rational numbers and Z is the set of integers.

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5. Let sets R and T be defined as $R = \{x \in Z \mid x ext{ is divisible by 2}\}$

 $T=\{x\in Z\mid x ext{ is divisible by 6}\}.$ Then $T\subset R.$

6. Given A= {0, 1, 2}, $B = \{x \in R \mid 0 \le x \le 2\}$. Then, A= B.



Question Of Module

1.
$$Aig\{x\in R\mid x^2+3=0ig\}$$
 is a set of......type.

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2.
$$B = \{x \in N \mid x \geq 7\}$$
 is a set of.....type.

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3.
$$C = \{\phi\}$$
 is a set of.....type.





6. $A = \{x \in N \mid 1 \leq x \leq 5\}$ then find n(P(A)) and n(P(P(A))).

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7.
$$B = \left\{ x \in N \mid x^2 + 4 = 0
ight\}$$
 then find P(B),

P(P(B)) and n(P(B)) and n(P(P(B))).

8. From Venn diagarm, obtain the number of elements of sets A and B.



Write the elements of sets A, B, $A \cup B, A \cap B$ and U.

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

 $U = \{1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11\}$ Show these sets in Venn diagram.



10. From the given venn diagram, find the elements of each sets.

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11. If
$$P(B)=rac{3}{4}, P\Big(A\cap B\cap \stackrel{-}{c}\Big)=rac{1}{3}$$
 and $P\Big(\stackrel{-}{A}\cap B\cap \stackrel{-}{C}\Big)=rac{1}{3}$, then

 $P(B \cap C)$ is equal to

12. Given that $n(U) = 200, n(A) = 77, n(B) = 98, n(A \cup B) = 141$

then find

 $n(A\cap B)$

13. Given that
$$n(U) = 200, n(A) = 77, n(B) = 98, n(A \cup B) = 141$$

then find

 $n(A \, ' \, \cap B)$

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14. Given that $n(U) = 200, n(A) = 77, n(B) = 98, n(A \cup B) = 141$

then find

 $n(A \cap B')$

15. Given that $n(U) = 200, n(A) = 77, n(B) = 98, n(A \cup B) = 141$

then find

 $n(A' \cap B')$

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16. Given that $n(U) = 200, n(A) = 77, n(B) = 98, n(A \cup B) = 141$ then find $n(A' \cup B').$

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17. Fill in the blanks by selecting appropriate alternative for the following questions :

 $\mathsf{If} \ A \subset B \ \text{ and } \ B \subset A \mathsf{ then } \mathsf{A}\mathsf{...}\mathsf{B}.$

A. =

B. ≠

C. ∈

D. ∉

Answer:

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18. Fill in the blanks by selecting appropriate alternative for the following

questions :

Relation between A - B and B - A is......



- B. \neq
- **C**. ⊂
- D. 🦯

Answer:
19. Fill in the blanks by selecting appropriate alternative for the following

questions :

 $(A' \cap B')' = \dots$

A. $A\cap B$

 $\mathsf{B.}\, A \cup B$

 $\mathsf{C}.\,A\,'\,\cap B$

D. $A\cap B$ '

Answer:

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20. Fill in the blanks by selecting appropriate alternative for the following

questions :

 $(A' \cup B')' = \dots \dots$

A. $A\cap B$

 $\mathsf{B.}\, A \cup B$

 $\mathsf{C}.\,A\,{'}\,\cap B$

 $\mathsf{D}.\,A\cap B\,{'}$

Answer:

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21. Fill in the blanks by selecting appropriate alternative for the following questions :

If $A = \{\phi, \{\phi\}\}$, then $n(P(A)) = \dots \dots$

A. 2

B. 4

C. 8

D. 16

Answer:



22. Fill in the blanks by selecting appropriate alternative for the following questions :

If $A=\{\phi,0,\ -1\}$, then $n(P(P(A)))=\ldots\ldots$

A. 8

B. 16

C. 256

D. 512

Answer:



23. Fill in the blanks by selecting appropriate alternative for the following

questions :

| If $n(U) = 2018, n(A) = 251, n(B) = 542, n(A \cap B)$ | = 88 then |
|---|-----------|
| $n(A\cup B)=\dots\dots$ | |
| A. 505 | |
| B. 555 | |
| C. 93 | |
| D. 705 | |
| | |

Answer:

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24. Fill in the blanks by selecting appropriate alternative for the following questions :

If n(U)=111, n(A)=62, n(B)=88 and $n(A'\cap B)=42$ then $n(A\cap B)=\ldots\ldots$

A. 46

B.42

C. 13

D. 5

Answer:

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25. Fill in the blanks by selecting appropriate alternative for the following questions :

......of the following is true interval for $(-3,7) \cap (8,11)$.

A. ϕ

B. (-3, 11)

C. (7, 8)

D. (-3, 8)

Answer:

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26. Fill in the blanks by selecting appropriate alternative for the following

questions : $(-2, 6) \cup (1, 7) = \dots$ A. (-2, 7)B. (1, 6)C. (-2, 1)D. ϕ

Answer:

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27. Fill in the blanks by selecting appropriate alternative for the following questions :

If Q is the set of rational numbers and Z is the set of integers then

 $Q \cap Z = \dots \dots$

| A. N | |
|-----------|--|
| B.Z | |
| C. Q | |
| D. ϕ | |

Answer:

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28. Fill in the blanks by selecting appropriate alternative for the following questions :

$$A=ig\{x\mid x\in R, x^2+8x+12=0ig\}$$
 , then $n(P(A))=\ldots\ldots\ldots\ldots$

A. 4

B. 2

C. 1

D. 0

Answer:

