QB365 Question Bank Software Study Materials

Set Language Important 2 Marks Questions With Answers (Book Back and Creative)

9th Standard

Maths

Total Marks : 60

2 Marks

30 x 2 = 60

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

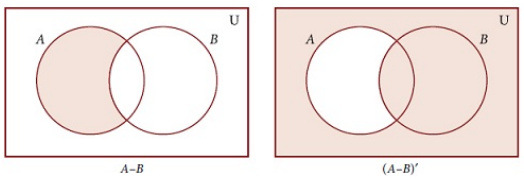
Answer : A = {1,2,3,4,5,7,9,11}

Since set A contains 8 elements, n(A) = 8.

2) Draw Venn diagram and shade the region representing the following sets

(A – B)′

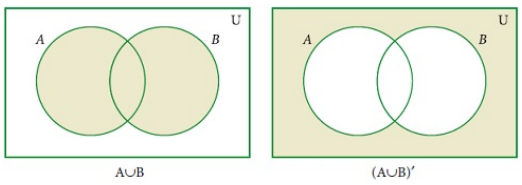
Answer : (A – B)′



3) Draw Venn diagram and shade the region representing the following sets

(A ∪ B)′

Answer : (A ∪ B)′



4) In a school, all students play either Hockey or Cricket or both. 300 play Hockey, 250 play Cricket and 110 play both games. Find

(i) the number of students who play only Hockey.

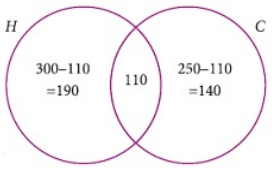
(ii) the number of students who play only Cricket.

(iii) the total number of students in the School.

Answer : Let H be the set of all students play Hockey and C be the set of all students play Cricket.

Then n(H) = 300, n(C) = 250 and n(H ∩ C) = 110

Using Venn diagram,



From the Venn diagram,

(i) The number of students who play only Hockey = 190

(ii) The number of students who play only Cricket = 140

(iii) The total number of students in the school = 190 + 110 + 140 = 440.

Aliter

(i) The number of students who play only Hockey

n(H-C) = n(H) – n(H∩C)

= 300 –110 = 190

(ii) The number of students who play only Cricket

n(C-H) = n(C) – n(H∩C)

= 250 – 110 = 140

(iii) The total number of students in the school

n(HUC) = n(H) + n(C) – n(H∩C)

= 300+250 – 110 = 440

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

PARALLELOGRAM

Answer : {P, A, R, L, E, O, G, M}

6) Represent the following sets in Roster form.

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

Answer : C = {64, 125}

7) 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.

Answer : B = {x: x is an Indian player who scored double centuries in One Day International}

8) Find the cardinal number of the following sets.

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

Answer : n(Q) = 3

9) 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"

Answer : Here n (A) = 5, n (B) = 5 and Every element of the set A is not an element of B

So, Equivalent sets

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

C = {2,3,4,5}

D = { x : x ∈ W, 1 < x < 5}

Answer : C and D does not have the same elements. So, Unequal sets

11) If S = {square, rectangle, circle, rhombus, triangle}, list the elements of the following subset of S.

The set of shapes which have 4 equal sides.

Answer : {square, rhombus}

12) If S = {square, rectangle, circle, rhombus, triangle}, list the elements of the following subset of S.

The set of shapes which have 5 sides.

Answer : { }

13) Write down the power set of the following sets.

X = {1, 2, 3}

Answer : {{ }, {1}, {2}, {3}, {1, 2}, {1, 3}, {2, 3 }, {1, 2, 3}}

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

Answer : n[P(A)] = 256

$2^m = 2^8$

n(A) = 8

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 $(A \cup B)'$

Answer : $A \cup B$ = {b, d, f, h} ∪ {a, d, e, h}

= {a, b, d, e, f, h}

$(A \cup B)' = U-(A \cup B)$

= {a, b, c, d, e, f, g, h} - {a, b, d, e, f, h}

= {c, g}

16) 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 $(A \cap B)'$

Answer : (A∩B) = {1, 3, 5, 7} ∩ {0, 2, 3, 5, 7}

= {3, 5, 7}

(A ∩B)' = U - (A∩B)

= {0, 1, 2, 3, 4, 5, 6, 7} - {3, 5, 7}

= { 0, 1, 2, 4, 6}

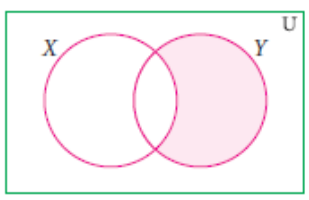
17) State which pairs of sets are disjoint or overlapping?

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

Answer : C ∩ D = { }

C and D are disjoint sets.

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



Answer : Y-X

19) Test for the commutative property of union and intersection of the sets

P = { x : x is a real number between 2 and 7} and

Q = { x : x is an rational number between 2 and 7}.

Answer : Commutative Property of union of sets

(A∪B) = (B∪A)

Here P = {3,4,5,6}, Q = {√3,√5,√6}

P∪Q = {3,4,5,6}∪{√3,√5,√6} = {3,4,5,6,√3,√5,√6} ...(1)

Q∪P = {√3,√5,√6}∪{3,4,5,6} = {√3,√5,√6,3,4,5,6} ...(2)

(1)=(2)

∴ P∪Q = Q∪P

∴ It is verified that union of sets is commutative.

Commutative Property of intersection of sets

(P∩Q) = (Q∩P)

P∩Q = {3,4,5,6}∩{√3,√5,√6} = { } ...(1)

Q∩P = {√3,√5,√6}∩{3,4,5,6} = { } ...(2)

From (1) and (2)

P∩Q = Q∩P

∴ It is verified that intersection of sets is commutative.

20) If A = {p, q, r, s}, B = {m, n, q, s, t} and C = {m, n, p, q, s}, then verify the associative property of union of sets.

Answer : Associative Property of union of sets

AU(BUC) = (AUB)UC

BUC = {m, n, q, s, t} U {m, n, p, q, s} = {m, n, p, q, s, t}

AU(BUC) = {p, q, r, s} U {m, n, p, q, s, t} = {m, n, p, q, r, s, t} ...(1)

(AUB) = {p, q, r, s} U {m, n, q, s, t} = {p, q, r, s, m, n, t}

(AUB)UC = {p, q, r, s, m, n, t} U {m, n, p, q, s} = {p, q, r, s, m, n, t}...(2)

From (1) & (2)

It is verified that AU(BUC) =(AUB)UC

21) IfA = {1,2,3} B = {3,5,6} C = {3,4,7}. Find

(i) A-(BUC)

(ii) BΔC

(iii) AΔB

Answer : (i) {1 ,2}

(ii) {4,5,6,7}

(iii) {1,2,5,6}

22) State Associative property of sets.

Answer : For any three sets A, B and C

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

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

23) State the formula to find $n(A \cup B \cup C)$

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

24) Given A = {-8, -7, -5, 1,2,4},B = {-7,1,3,4,5,6}, C= {-8, -5,2,4,6,7}. Find

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

Answer : 1. B∩C = {4,6}

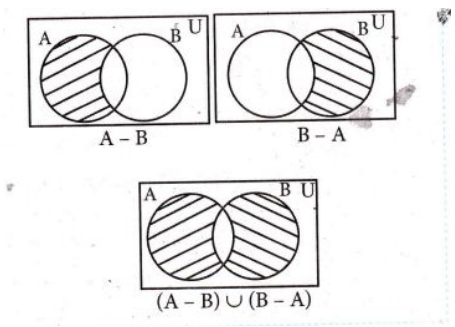
$A - (B \cap C)$ = { -8, -7, -5, 1,2}

2. B∪C = {-8, -7, -5,1,2,3,4,5;6,7}

$A - (B \cup C)$= {}

25) Represent $(A - B) \cup (B - A)$ in venn diagram.

Answer :



26) If U = $\{x : 20 \leq x < 28, x \in N\}$ A = $\{x : 20 \leq x \leq 24, x \in N\}$B = $\{26, 27\}$Find $(A \cap B) \cup (A \cap B')$

Answer : U = {21, 22, 23, 24, 25, 26, 27}

A = {21, 22, 23, 24}

A∩B = { }

B' = { 20, 21,22,23,24,25}

A∩B' = { 20, 21, 22, 23, 24}

$(A \cap B) \cup (A \cap B')$ = { 20, 21,22,23,24}

27) If A = {2,4,6,8} B = {1,2,3,4} U = {1,2,3,.....:..... 10} then Find $A' \cup B'$ and $A' \cap B'$.

Answer : A' = { 1,3,5,7,9,10 }

B' = { 5, 6,7,8,9,10 }

A'∪B' = {1,3,5,6,7,8,9,10}

A'∩B' = {5,7,9,10}

28) If U = $\{x : 1 \leq x < 20\}$ A = { 1,2,3,4,5,6,7,8,9} and B = {2,4,6,8} find

1. $(A \cup B)'$
2. A - B

Answer : U = { 1, 2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18,19 }

A∪B = { 1,2, 3, 4,5, 6,7, 8}

(A∪B)' = { 9, 10, 11, 12,13,14,15,16,17,18,19 }

A - B = {1,3,5,7}

29) Represent the set P = { January, June, July} in descriptive form.

Answer : P = The set of English months starting with letter 'J'.

30) If A = {1,2,3} B = {3,5,6} C = {3,4,7}. Find A - (BUC)

Answer : {1 ,2}