DPP

DAILY PRACTICE PROBLEMS

Class : XIth
Date :

Solutions

Subject : MATHS
DPP No. :6

Topic :-SETS

101 **(c)**

We have,

$\{x \in Z:|x-3|<4\}=\{x \in Z:-1<x<7\}=\{0,1,2,3,4,5,6\}$

and,

$\{x \in Z:|x-4|<5\}=\{x \in Z:-1<x<9\}$

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

$\therefore \{x \in Z:|x-3|<4\} \cap \{x \in Z:|x-4|<5\}$

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

102 **(a)**

Since R is reflexive relation on A

$\therefore (a,a) \in R$ for all $a \in A$

$\Rightarrow$ The minimum number of ordered pairs in R is n

Hence, $m \geq n$

104 **(c)**

We have, $y=\frac{4}{x}$ and $x^2+y^2=8$

Solving these two equations, we have

$x^2+\frac{16}{x^2}=8 \Rightarrow (x^2-4)=0 \Rightarrow x=\pm 2$

Substituting $x=\pm 2$ in $y=\frac{4}{x}$, we get $y=\pm 2$

Thus, the two curves intersect at two points only (2, 2) and $(-2, 2)$. Hence, $A \cap B$ contains just two points

105 **(b)**

Let $(a,b) \in R$. Then,

$|a+b|=a+b \Rightarrow |b+a|=b+a \Rightarrow (b,a) \in R$

$\Rightarrow R$ is symmetric

106 **(c)**

Minimum possible value of $n(B \cap C)$ is $n(A \cap B \cap C)=3$

107 **(a)**

To make R a reflexive relation, we must have (1,1),(3,3) and (5,5) in it. In order to make R a symmetric relation, we must inside (3,1) and (5,3) in it.

Now, $(1,3) \in R$ and $(3,5) \in R$. So, to make R a transitive relation, we must have, $(1,5) \in R$. But, R must be symmetric also. So, it should also contain $(5,1)$. Thus, we have

$R = \{(1,1),(3,3),(5,5),(1,3),(3,5),(3,1),(5,3),(1,5),(5,1)\}$

Clearly, it is an equivalence relation on $A\{1,3,5\}$

108 **(b)**

Clearly, $(3,3) \notin R$. So, R is not reflexive. Also, $(3,1)$ and $(1,3)$ are in R but $(3,3) \notin R$. So, R is not transitive

But, R is symmetric as $R = R^{-1}$

109 **(b)**

Let $(a,b) \in R$. Then,

$(a,b) \in R \Rightarrow (b,a) \in R^{-1}$ [By def. of R^{-1}]

$\Rightarrow (b,a) \in R$ [$\because R = R^{-1}$]

So, R is symmetric

110 **(b)**

We have,

$A_2 \subset A_3 \subset A_4 \subset \ldots \subset A_{10}$

$$\therefore \bigcap_{n=3}^{10} A_n = A_3 = \{2,3,5\}$$

111 **(c)**

The possible sets are $\{\pm 2, \pm 3\}$ and $\{\pm 4, \pm 1\}$; therefore, number of elements in required set is 8.

112 **(a)**

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

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

And $B \cap C = \{b, c, d\} \cap \{a, d, c\} = \{c, d\}$

$\therefore (A - B) \times (B \cap C) = \{a\} \times \{c, d\}$

$= \{(a, c), (a, d)\}$

113 **(c)**

Given, $n(M) = 100, n(P) = 70, \quad n(C) = 40$

$n(M \cap P) = 30, \quad n(M \cap C) = 28,$

$n(P \cap C) = 23$ and $n(M \cap P \cap C) = 18$

$\therefore n(M \cap P' \cap C') = n[M \cap (P \cap C')]$

$= n(M) - n[M \cap (P \cap C)]$

$= n(M) - [n(M \cap P) + n(M \cap C) - n(M \cap P \cap C)]$

$= 100 - [30 + 28 - 18 = 60]$

114 **(d)**

$B \cap C = \{4\}$.

$\therefore A \cup (B \cap C) = \{1, 2, 3, 4\}$

115 **(c)**

$\because \quad A \subseteq B$

$\therefore \quad B \cup A = B$

116 **(c)**

$n((A \cup B)^c\} = n(\mathcal{U}) - n(A \cup B)$

$= n(\mathcal{U}) - \{n(A) + n(B) - n(A \cap B)\}$
$= 100 - (50 + 20 - 10) = 40$
117 **(d)**
If $A = \{1,2,3\}$, then $R = \{(1,1),(2,2),(3,3),(1,2)\}$ is reflexive on A but it is not symmetric
So, a reflexive relation need not be symmetric
The relation 'is less than' on the set Z of integers is antisymmetric but it is not reflexive
119 **(c)**
Clearly,
Required percent $= 20 + 50 - 10 = 60\%$
$[\because n(A \cup B) = n(A) + n(B) - n(A \cap B)]$
120 **(c)**
The greatest possible value of $n(A \cap B \cap C)$ is the least amongst the values $n(A \cap B)$,$n(B \cap C)$ and $n(A \cap C)$ i.e. 10

ANSWER-KEY										
Q.	1	2	3	4	5	6	7	8	9	10
A.	C	A	B	C	B	C	A	B	B	B
Q.	11	12	13	14	15	16	17	18	19	20
A.	C	A	C	D	C	C	D	B	C	C