Delhi Public School Guwahati
"Under the aegis of the Delhi Public School Society, Delhi"

SUMMER VACATION HOMEWORK

SUBJECT: APPLIED MATHEMATICS

CLASS: XI

SOLVE THE FOLLOWING QUESTIONS:

1. These are 20 students in an accountancy class and 30 students in an applied maths class. Find the number of students which are either in accountancy class or applied maths class in the following cases.

    (i) Two classes meet at the same period.
    (ii) The two classes met at different periods and ten students are enrolled in both the courses.

2. Write the set $\left\{\frac{1}{2}, \frac{2}{5}, \frac{3}{10}, \frac{4}{17}, \frac{5}{26}, \frac{6}{37}, \frac{7}{50}\right\}$ in the set-builder form.

3. Write the cardinal number of the set of all integers x for which $\frac{30}{x}$ is a natural number.

4. Write the power set of A, where $A = \{-1, 0, 2\}$.

5. Let U be the set of all triangles in a plane. If A is the set of all triangles in that plane with at least one angle different from 60^0, what is A'?

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
   (i) A'
   (ii) B'
   (iii) $(A \cap C)'$
   (iv) $(A \cup B)'$
   (v) $(A')'$
   (vi) $(B - C)'$

7. Let A and B be two sets such that $n(A) = 35$, $n(A \cap B) = 11$ and $n((A \cup B)') = 17$. If $n(U) = 57$, find
    (i) $n(B)$
    (ii) $n(A - B)$
    (iii) $n(B - A)$

8. Out of 280 students in class XII of a school, 135 play Hockey, 110 play football, 80 play volleyball, 35 of these play hockey and football, 30 play volleyball and hockey, 20 play football and volleyball. Also, each student play at least one of the three games. How many students play all the three games?

9. Two finite sets have m and n elements respectively. The total number of subsets of the first set is 192 more than the total number of subsets of the second set. Find the values of m and n.

10. If A and B are two sets and U is the universal set such that $n(U) = 700$, $n(A) = 290$, $n(B) = 240$ and $n(A \cap B) = 110$, then find $n(A' \cap B')$.

11. If the ordered pairs $(x - 1, y + 3)$ and $(2, x + 4)$ are equal, find x and y.

12. If $A = \{1, 2\}$ and $B = \{1, 3\}$, find $A \times B$ and $B \times A$.

13. If $A = \{1, 2, 3\}$ and $B = \{3, 4\}$, what are $A \times B$, $B \times A$, $B \times B$ and $(A \times B) \cap (B \times A)$?

14. Let A and B be two sets such that $n(A) = 5$ and $n(B) = 2$, If $(a, 1), (b, 5), (c, 5), (d, 1), (e, 5)$ are in $A \times B$, find A and B, where $a, b, c\, d, e$ are distinct elements. Also write the remaining elements of $A \times B$.

15. If $a \in \{-1, 2, 3, 4, 5\}$ and $b \in \{0, 3, 6\}$, write the set of all ordered pairs (a, b) such that $a + b = 5$.

16. If $x \in \{2, 3, 5\}$ and $y \in \{2, 4, 6\}$, form the set of all ordered pairs (x, y) such that $x < y$.

17. If a relation $R = \{(0, 0), (2, 4), (-1, -2), (3, 6), (1, 2)\}$, then
        (i) Write the domain of R
        (ii) Write the range of R
        (iii)Write R in the builder form
        (iv)Represent R by an arrow diagram

18. Write the following relations in the roster form:
        (i) $R = \{(x, x^3) : x \text{ is a prime number less than } 10\}$
        (ii) $R = \{(x - 2, x^2) : x \text{ is a prime numberv less than } 10\}$

19. If $A = \{a, b\}$ and $B = \{x, y, z\}$, find the number of relations from A to B.

20. If $R = \{(x, y) : x, y \in W, x^2 + y^2 = 169\}$, then find the domain of R.

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