



# CAMBRIAN PUBLIC SCHOOL, Kanke Road, Ranchi

## Summer Vacation Assignment – Class 11 Subject- Mathematics

- Write the following sets in the roster form.
  - $A = \{x \mid x \text{ is a positive integer less than } 10 \text{ and } 2x - 1 \text{ is an odd number}\}$
  - $C = \{x: x^2 + 7x - 8 = 0, x \in \mathbb{R}\}$
- Write the following sets in roster form:
  - $A = \{x: x \text{ is an integer and } -3 \leq x < 7\}$
  - $B = \{x : x \text{ is a natural number less than } 6\}$
- Given that  $N = \{1,2,3,\dots,100\}$  then
  - Write the subset  $A$  of  $N$ , whose elements are odd numbers.
  - Write the subset  $B$  of  $N$ , whose elements are represented by  $x+2$ , where  $x \in N$ .
- Let  $X = \{1,2,3,4,5,6\}$ . If “ $n$ ” represent any member of  $X$ , express the following as sets:
  - $n \in X$  but  $2n \notin X$
  - $n + 5 = 8$
  - $n$  is greater than 4
- 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  $(A \cup B)' = A' \cap B'$ .
- Use the properties of sets to prove that for all the sets  $A$  and  $B$ ,  $A - (A \cap B) = A - B$
- Let  $U = \{1,2,3,4,5,6,7\}$ ,  $A = \{2,4,6\}$ ,  $B = \{3,5\}$  and  $C = \{1,2,4,7\}$ ,  
find (i)  $A' \cup (B \cap C')$  (ii)  $(B - A) \cup (A - C)$
- If  $X = \{1,2,3\}$ , if  $n$  represents any member of  $X$ , write the following sets containing all numbers represented by (i)  $4n$  (ii)  $n+6$  (iii)  $\frac{n}{2}$  (iv)  $n-1$
- Solve  $3x+8>2$ , when (i)  $x$  is an integer (ii)  $x$  is a real number.
- The cost and revenue functions of a product are given by  $C(x) = 20x + 4000$  and  $R(x) = 60x + 2000$  respectively, where  $x$  is the number of items produced and sold. How many items must be sold to realise some profit?
- Solve the given linear inequalities  $3x-2 < 2x+1$  and show the graph of the solution in the number line.
- Ravi scored 70 and 75 marks in the first two-unit test. Calculate the minimum marks he should get in the third test to have an average of at least 60 marks.
- A solution is to be kept between  $40^\circ\text{C}$  and  $45^\circ\text{C}$ . What is the range of temperature in degree Fahrenheit, if the conversion formula is  $F = (9/5)C + 32$ ?
- Solve the given inequality for real  $x$  :  $x - 4 < [5x - 2] - [3 - 7x - 3] + 5$
- Solve the given inequality  $3(1-x) < 2(x+4)$  and represent the solution in the number line.
- Determine all pairs of consecutive even positive integers, both of which are greater than 5 such that their sum is less than 23.
- The longest side of a triangle is twice the shortest side and the third side is 2 cm longer than the shortest side. If the perimeter of the triangle is more than 166 cm, then find the minimum length of the shortest side.
- Prove that the following system of linear inequalities has no solution:  $x + 2y \leq 3$ ,  $3x + 4y \geq 12$ , where  $x \geq 0$ ,  $y \geq 1$
- If  $x$  is real number and  $|x| < 3$ , then (a)  $x \geq 3$  (b)  $-3 < x < 3$  (c)  $x \leq -3$  (d)  $-3 \leq x \leq 3$