

**SAINIK SCHOOL AMBIKAPUR**  
**WINTER VACATION HOMEWORK 2024**  
**SUBJECT: MATHEMATICS**  
**CLASS: XI**

**Do all the following Activities : -**

1. To find the number of subsets of a given set and verify that if a set has  $n$  number of elements, then the total number of subsets is  $2^n$ .
2. To represent set theoretic operations using Venn diagrams.
3. To verify distributive law for three given non-empty sets  $A$ ,  $B$  and  $C$ , that is,  $A \cup (B \cap C) = (A \cup B) \cap (A \cup C)$
4. To identify a relation and a function.
5. To verify the relation between the degree measure and the radian measure of an angle.
6. To find the values of sine and cosine functions in second, third and fourth quadrants using their given values in first quadrant.
7. To plot the graphs of  $\sin x$ ,  $\sin 2x$ ,  $2 \sin x$  and  $\sin \frac{x}{2}$ , using same coordinate axes.
8. To interpret geometrically the meaning of  $i = -1$  and its integral powers.
9. To verify that the graph of a given inequality, say  $5x + 4y - 40 < 0$ , of the form  $ax + by + c < 0$ ,  $a, b > 0$ ,  $c < 0$  represents only one of the two half planes.
10. To construct different types of conic sections.