CBSE
EXAMS. 2013

PLEASURE TEST REVISION SERIES XI
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PTRSXI
TEST – 01

**Time Allowed: 120 Minutes**          **Max. Marks: 50**

**Based on: Mathematical Induction, Complex Numbers, Linear Inequalities**

1. Find the multiplicative inverse of: $2 - 3\,i$.

2. Solve: $|3 - 4x| \geq 9$.

3. Find the least positive value of n, if $\left(\dfrac{1+i}{1-i}\right)^{n} = 1$.

4. Express $\dfrac{3 - 4\,i}{(4 - 2\,i)(1 + i)}$ in the standard form.

5. What is the conjugate of $\dfrac{\sqrt{5 + 12\,i} + \sqrt{5 - 12\,i}}{\sqrt{5 + 12\,i} - \sqrt{5 - 12\,i}}$ ?

6. Show that "$2n + 1 > 2n$", for all natural numbers $n \geq 3$.

7. The water acidity in a pool is considered normal when the average pH reading of three daily measurements is between 8.2 and 8.5. If the first two pH readings are 8.48 and 8.35, find the range of pH value for the third reading that will result in the acidity level being normal.

8. Using the principal of mathematical induction, prove that $10^{2n-1} + 1$ is divisible by 11.

9. Solve the system of inequalities graphically: $x + 2y \leq 8$, $2x + y \leq 8$.

10. Prove that $\displaystyle\sum_{t=1}^{n-1} t\,(t+1) = \dfrac{n(n-1)(n+1)}{3}$, for all natural numbers $n \geq 2$.

11. Express the complex number $z = \dfrac{1 - i}{\cos 60^{\circ} + i\sin 60^{\circ}}$ in polar form.

12. If $(x + i\,y)^{1/3} = u + i\,v$, where $x, y, u, v \in R$ then, show that: $\dfrac{x}{u} - \dfrac{y}{v} = -2\left[u^{2} + v^{2}\right]$.

    **(OR)** Find the square root of complex number: $-15 + 8\,i$.

13. Calculate mean, variation and standard deviation of the following frequency distribution:

| Classes | 0 – 10 | 10 – 20 | 20 – 30 | 30 – 40 | 40 – 50 | 50 – 60 |
|---|---|---|---|---|---|---|
| Frequency | 11 | 29 | 18 | 4 | 5 | 3 |