SREE VIDYANIKETHAN
International School

Holiday Homework

Class: IX **Subject: Mathematics**

1. Find the value of x, if $5^{x-3} - 3^{2x-8} = 225$.

2. If $x = \frac{\sqrt{3}+\sqrt{2}}{\sqrt{3}-\sqrt{2}}$ and $y = \frac{\sqrt{3}-\sqrt{2}}{\sqrt{3}+\sqrt{2}}$, then find the value of $x^2 + xy - y^2$.

3. Find the value of a and b so that $x + 1$ and $x - 1$ are factors of $x^4 + ax^3 + 2x^2 - 3x + b$.

4. Divide polynomial $p(x) = 3x^4 + 4x^3 + 4x^2 - 8x + 1$ by $q(x) = 3x + 1$. Also, find what should be added to $p(x)$ so that it is completely divisible by (x).

5. Factorise the following using suitable identities:
   i. $x^2 - y^2 + 2x + 1$
   ii. $9a^2 - 4b^2 - 6a + 1$
   iii. $a^4 - 16b^4$

6. Prove that $(x + y)^3 + (y + z)^3 + (z + x)^3 - 3(x + y)(y + z)(z + x) = 2(x^3 + y^3 + z^3 - 3xyz)$

7. Plot the following points in the coordinate plane: A(-4,4), B(-6,0), C(-4,-4), D(-2,0) and name the figure formed by joining points A, B, C, and D also find its area.

8. P (3,2) and Q (7,7) are two points. Perpendiculars are drawn to the X-axis from P and Q meeting the X-axis at L and M respectively.
   i. Find the coordinates of L and M.
   ii. Find the length of LM.

9. If a point lies on the y-axis, then what will be its abscissa?

10. A floor design is made on a floor of a room by joining four triangular tiles of dimensions 12 cm, 20 cm and 24 cm each. Find the cost of the tiles at the rate of ₹ $\sqrt{9}$ per cm^2.