Bose Einstein Scholarship Test

An endeavour of International Research Scholars and Mentors with JMMC Research Foundation

Sample Question for Class - 9

1. What is the set of values of **a** for which the inequality $4^x - a(2^x) - a + 3 \le 0$ is satisfied by atleast one real x ?

(a) $[-1,\infty)$ (b) $[0,\infty)$ (c) $[1,\infty)$ (d) $[2,\infty)$

2. Let α,β be the roots of $x^2 + px + 1 = 0$ and γ,δ be the roots of $x^2 + qx + 1 = 0$. What is the value of the following expression? $P = (\alpha-\gamma)(\beta-\gamma)(\alpha+\delta)(\beta+\delta)$

(a) $q^2 - p^2$ (b) $p^2 - q^2$ (c) $(p+q)^2$ (d) $(p-q)^2$

3. If $a_1, a_2, \ldots\ldots a_n$ is an AP of non-zero terms , what is the sum of the following series?

$$\frac{1}{a_1 a_2} + \frac{1}{a_2 a_3} + \ldots\ldots\ldots\ldots + \frac{1}{a_{n-1} a_n}$$

(a) $\dfrac{(n-1)^2}{a_1 a_2 a_{n-1} a_n}$ (b) $\dfrac{n^2}{a_1 a_2 a_{n-1} a_n}$ (c) $\dfrac{n-1}{a_1 a_n}$ (d) $\dfrac{n}{a_1 a_n}$

4. $\dfrac{a^5}{120} + \dfrac{a^4}{12} + \dfrac{7a^3}{24} + \dfrac{5a^2}{12} + \dfrac{a}{5} = ?$

(a) a /120 (a+1)(a+2)(a+4)(a+5) (b) a /120(a+1)(a+2)(a+3)(a+4)

(c) a /120(a+1)(a+3)(a+4)(a+5) (d) None of these.

5. A cube of white chalk is painted red, and then cut parallel to the sides to form two rectangular solids of equal volume. What percent of the surface area of each of the new solids is not painted red ?

(a) 20 % (b) $16\frac{2}{3}\%$ (c) 15% (d) 25%

6. A equilateral triangle is drawn with a side of length '*a*'. A new equilateral triangle is formed by joining the midpoints of the sides of the first one. Then a third equilateral triangle is formed by joining the midpoints of the sides of the second; and so on forever. The limit of the sum of the perimeters of all the triangles thus drawn is

(a) infinite (b) $5\frac{1}{4}a$ (c) $2a$ (d) $6a$

7. Prime factors of the number 111111 are

(a) 21, 11, 13, 37

(b) 7, 33, 13, 37

(c) 7, 11, 39, 37

(d) 3, 7, 11, 13, 37

8. If $\sqrt{(x+a)^2+y^2}\cdot\sqrt{(x-a)^2+y^2} = \sqrt{(x+b)^2+y^2}\cdot\sqrt{(x-b)^2+y^2}$ then

$(x^2 - y^2) = ?$

(a) $a^2 - b^2$ (b) $\frac{a^2-b^2}{2}$

(c) $a^2 + b^2$ (d) $\frac{a^2+b^2}{2}$

9. How many digits will be there in 875^{16} ?

(a) 47 (b) 48 (c) 49 (d) 50