ELIXIIT ACADEMY
— The Toppers' Point

ELIXIIT ACADEMY | Email- support@elixiitacademy.in | Website – www.elixiitacademy.in
Contact—8335068993 | Address- 512 Lake Gardens, Kol-700045 & 23 Kalikapur, Near Prince Park, Kolkata—700099

ASSIGNMENT→ 1

1. Find the gcd of the numbers i) $2n + 13$ & $n + 7$

ii) $n^3 + 2n$ & $n^4 + 3n^2 + 1$

2. Consider the following series of number—

1

2 3

4 5 6

7 8 9 10

11 12 13 14 15

……

Find the sum of the n^{th} row. (Ans will be in terms of n)

3. If 72 is a number that divides a679b written in decimal, what are the digits a & b.

4. Suppose m, n are integers and $m = n^2 - n$. Then show that $m^2 - 2m$ is divisible by 24

5. Consider three positive real numbers a, b and c. Show that there cannot exist two distinct positive integers m & n such that both $a^m + b^m = c^m$ & $a^n + b^n = c^n$ holds.

6. p, q are two distinct primes,

prove that $p^{q-1} + q^{p-1} \equiv 1 \ (mod\ pq)$

7. p is an odd prime,

prove that $1^p + 2^p + 3^p + \cdots + (p-1)^p \equiv 0 \ (mod\ p)$

8. What are the last two digits of the number $7^{100} - 3^{100}$?

9. If p & q are real, prove that any real root α of $x^3 + px + q = 0$ satisfies

$$p^2 - 4\alpha q \geq 0$$

10. Prove that if n > 4, then the number $1! + 2! + 3! + \cdots + n!$ is not a perfect square.