RK TUITION CENTRE - KUMBAKONAM

10^{TH} MATHEMATICS
NUMBERS AND SEQUENCES

25 X 2 = 50

1. Find the quotient and remainder when a is divided by $a = -1, b = 5$.
2. Show that the square of an odd integer is of the form $4q + 1$, for some integer q.
3. Find all positive integers, when divided by 3 leaves remainder 2.
4. A man has 532 flower pots. He wants to arrange them in rows such that each row contains 21 flower pots. Find the number of completed rows and how many flower pots are left over.
5. Can the number 6^n. n being a natural number end with the digit 5? Give reason for your answer.
6. Is $7 \times 5 \times 3 \times 2 + 3$ a composite number? Justify your answer.
7. $'a'$ and $'b'$ are two positive integers such that $a^b \times b^a = 800$. Find $'a'$ and $'b'$.
8. For what values of natural number n, 4^n can end with the digit 6?
9. If m, n are natural numbers, for what values of m, does $2^n \times 5^m$ ends in 5?
10. If $13824 = 2^a \times 3^b$ then find a and b.
11. The general term of a sequence is defined as

    $a_n = \begin{cases} n(n+3) & ; n \in N \ \ is\ odd \\ n^2 + 1 & ; n \in N\ is\ even \end{cases}$

    Find the eleventh and eighteenth terms.
12. Find the first five terms of the following sequence.

    $a_1 = 1, a_2 = 1, a_n = \frac{a_n - 1}{a_{n-2}+3}; n \geq 3, n \in N$
13. Find the next three terms of the following sequence.

    8,24,72, ...
14. Find a_8 and a_{15} whose n^{th} term is an $= \begin{cases} \frac{n^2-1}{n+3} & ;\ n\ is\ even,\ n \in N \\ \frac{n^2}{2n+1} & ;\ n\ is\ odd, n \in N \end{cases}$
15. Writ an $A.P.$ whose first term is 20 and common difference is 8.
16. Find the $15^{th}, 24^{th}$ and n^{th} term (general term) of an $A.P.$ given by 3,15,27,39.
17. Find the number of terms in the A.P. 3,6,9,12, ...111.
18. Check whether the following sequences are in A.P. $a - 3, a - 5, a - 7$ ...
19. Find the first term and common difference of the Arithmetic Progressions whose nth terms are given below. $t_n = -3 + 2n$
20. Find the 19^{th} term of an A.P. $-11, -15, -19$, ...
21. Which term of an A.P. 16,11,6.1, ...is-54?
22. Find the middle term(s) of an A.P. 9,15,21,27, ...183.
23. If nine times ninth term is equal to the fifteen times fifteenth term, show that six times twenty four term is zero.
24. If $3 + k, 18 - k, 5k + 1$ are in A.P. then find k.
25. Find x, y and z. Given that the numbers $x, 10, y, 24, z$ are A.P.

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26. Find the greatest number that will divide 445 and 572 leaving remainders 4 and 5 respectively.

27. Find the HCF of 396,504,636.

28. If $p_1^{x_1} \times p_2^{x_2} \times p_3^{x_3} \times p_4^{x_4} = 113400$ where p_1, p_2, p_3, p_4 are primes in ascending order and x_1, x_2, x_3, x_4 are integers. Find the value of p_1, p_2, p_3, p_4 and x_1, x_2, x_3, x_4.

29. Find the greatest number consisting of 6 digits which is exactly divisible by 24,15,36?

30. Determine the general term of an A.P. whose 7^{th} term is -1 and 16^{th} term is 17.

31. In an A.P. sum of four consecutive terms is 28 and their sum of their squares is 276. Find the four numbers.

32. A mother divides Rs.207 into three parts such that the amount are in A.P. and gives it to her three children. The product of the two least amounts that the children had Rs. 4623. Find the amount received by each child.

33. The sum of three consecutive terms that are in A.P. is 27 and their product is 288. Find the three terms.

34. The ratio of $6^{th}$and 8^{th} term of an A.P. is 7: 9 Find the ratio of $9th$ term to 13^{th} term.

35. If the 8^{th} term of an A.P. is 31 and the 15^{th} term is 16 more than the 11^{th} term, find the A.P.

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