INDIAN SCHOOL NIZWA - WORKSHEET

MATHEMATICS

5. Arithmetic Progressions

Nam_____ Date:_____ Class: X Sec: ___

1.	What is the common difference of the arithmetic progression : 10, 5, 0, -5 ?
2.	Find the sum of the first 10 natural numbers.
3.	Let a_n be an arithmetic progression, for which the first term a_1=1 and the common difference d=1. Find a_{1083}.
4.	Let a_n be an arithmetic progression , for which $a_1 + a_2 + a_3 = 102 \ \ and \ a_1 = 15, find \ a_{10}$.
5.	For what value of k : 2k, k+10 and 3k+2 are in A.P?
6.	In an AP , if a=1, $a_n = 20, and \ S_n = 399$, then find n?
7.	Find the 9th term from the end of the AP 5,9,13,……,185.
8.	How many terms of the AP 18, 16, 14, ……be taken so that their sum is zero.
9.	Find the number of natural numbers between 101 and 999 which are divisible by both 2 and 5.
10.	Find the 31st term of an AP whose 11th term is 38 and the 16th term is 73.
11.	The first term, common difference and last term of an AP are 12, 6 and 252 respectively. Find the sum of all terms of this AP.
12.	If S_n denotes the sum of the first n terms of an AP, prove that $\boldsymbol{S_{30} = 3(S_{20} - S_{10})}$.
13.	If the sum of the first m terms of an AP is $2m^2 + 3m$, then what is its second term?
14.	Reshma wanted to save at least ₹6,500 for sending her daughter to school next year (after 12 months). She saved ₹450 in the first month and raised her savings by ₹20 every next month. How much will she be able to save in the next 12 months? Will she be able to send her daughter to the school next year?
15.	If the sum of the first n terms of an A.P be $\boldsymbol{3n^2 + n}$ and its common difference is 6, find its first term.
16.	If the sum of first 6 terms of an A.P is 36 and that of the first 16 terms is 256, find the sum of first 10 terms.
17.	If a,b and c form an A.P. with common difference d, then find the value of a-2b-c.
18.	Find the middle term of the AP -6, -2, 2, ……., 58.
19.	A contractor has to pay a certain fine if he is unable to complete the work on time. The fine for first day is ₹150 and it increases ₹ 25 everyday. What is the penalty for the 21 st day ? What is the total penalty paid for 30 days ?
20.	How many three digit numbers are such that when divided by 7, leave a remainder 3 in each case.

	Q 21 to 31-Only for Mathematics Standard:
21.	The sum of four consecutive numbers in AP is 32 and the ratio of product of the first and last terms to the product of two middle terms is 7:15. Find the numbers.
22.	If the sum of first n terms of two APs is (7n+1):(4n+27), find the ratio of their m th terms
23.	The ratio of the 11^{th} term to the 18^{th} term of an A.P is 2:3. Find the ratio of the 5^{th} term to the 21^{st} term. Also, find the ratio of the sum of first 5 terms to the sum of first 21 terms.
24.	Show that $(\boldsymbol{a-b})^2, (\boldsymbol{a^2+b^2})$ $\boldsymbol{and}$ $(\boldsymbol{a+b})^2$ are in A.P.
25.	In an AP of 50 terms, the sum of first 10 terms is 210 and the sum of its last 15 terms is 2565. Find the AP. [hint: 15^{th} term from the last 50-14=36. So last 15 terms starts from term number 36.]
26.	Divide 56 into 4 parts such that the ratio of the product of their extremes (1 st and 4 th) to the product of means (2^{nd} and 3^{rd}) is 5:6.
27.	If $\boldsymbol{S_n}$ denotes the sum of first n terms of an AP, prove that $\boldsymbol{S_{12} = 3(S_8 - S_4)}$.
28.	There are 49 plants in arrow numbered 1 to 49 in order. Find the value of x such that the sum of numbers preceding x and sum of numbers after x are equal.
29.	The p th term of an AP is 1/q and the q th term is 1/p. Find the sum of pq terms of the AP.
30	Sum of first m terms of an AP is equal to sum of first n terms. Show that the sum of first m+n terms is zero.
31.	**CASE STUDY [standard and basic mathematics]** Ram wants to buy a car and plans to take loan from a bank for his car. He repays his total loan of ₹ 1,18,000 by paying every month starting with the first instalment of ₹ 1000. If he increases the instalment by ₹100 every month, answer the following:  a) Find the amont paid in the 30^{th} instalment? b) Find the total amont paid in 30 instalments. c) What amount does he still have to pay after 30^{th} instalment? d) If total installments are 40 then find the amount paid in the last instalment?