



INDIAN SCHOOL NIZWA - WORKSHEET

MATHEMATICS

9. Sequences and Series

Name: _____

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Class: XI Sec: A

1. The first term of a G.P. is 1. The sum of the third term and fifth term is 90. Find the common ratio of G.P.
2. The p^{th} , q^{th} and r^{th} terms of an A.P. are a , b , c , respectively. Show that $(q - r)a + (r - p)b + (p - q)c = 0$
3. Find the sum of the following series up to n terms: $5 + 55 + 555 + \dots$
4. If a , b , c are in G.P. and $\frac{1}{a^x} = \frac{1}{b^y} = \frac{1}{c^z}$, prove that x , y , z are in A.P.
5. If A.M. and G.M. of two positive numbers a and b are 10 and 8, respectively, find the numbers.
6. Insert three numbers between 1 and 256 so that the resulting sequence is a G.P.
7. The sum of first three terms of a G.P. is $\frac{13}{12}$ and their product is -1 . Find the common ratio and the terms.
8. In a G.P., the 3rd term is 24 and the 6th term is 192. Find the 10th term.
9. Let the sequence a_n be defined as follows:
 $a_1 = 1$, $a_n = a_{n-1} + 2$ for $n \geq 2$.
Find first five terms.
10. The product of three terms in GP is 1000. If 6 and 7 are added to second and third term respectively, the terms form an AP, find the GP.
11. The sum of four numbers in GP is 60 and the arithmetic mean of the first and last is 18. Find the numbers.
12. Find the sum of n terms of the series $0.5 + 0.55 + 0.555 + \dots$ n terms.
13. The sum of first three terms of a GP is 7 and the sum of their squares is 21. Find the first five terms of GP.
14. The A. M. between two positive numbers a and b is twice the G. M. between them
The ratio of the numbers is
(a) $(\sqrt{2} + 3) : (\sqrt{2} - 3)$ (c) $(\sqrt{3} + 1) : (\sqrt{3} - 1)$
(b) $(2 + \sqrt{3}) : (2 - \sqrt{3})$ (d) None of these
15. Let $a_1, a_2, a_3, \dots$ be the sequence. then the sum expressed as $a_1 + a_2 + a_3 + \dots + a_n$ is called
(a) Sequence (b) Series
(c) Finite (d) Infinite



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16. 4th term from the end of the G.P. 3, 6, 12, 24, 3072 is
 (a) 348 (b) 843
 (c) 438 (d) 384
17. The third term of a geometric progression is 4. The product of the first five terms is :
 (a) 4^3 (b) 4^5 (c) 4^4 (d) 4^7
18. How many terms of G.P. 3, 3^2 , 3^3 , are needed to give the sum 120?
 (a) 3 (b) 4 (c) 5 (d) 6
19. If 1, x, y, z, 16 are in geometric progression, then what is the value of $x + y + z$?
 (a) 8 (b) 12 (c) 14 (d) 16
20. There are four arithmetic means between 2 and -18. The means are
 (a) -4, -7, -10, -13 (b) 1, -4, -7, -10
 (c) -2, -5, -9, -13 (d) -2, -6, -10, -14

Assertion and Reason:

21. **Assertion:** For $x = \pm 1$, the numbers $\frac{-2}{7}$, x, $\frac{-7}{2}$ are in G.P.
Reason: Three numbers a, b, c are in G.P. if $b^2 = ac$.
22. **Assertion:** Sum to n terms of the geometric progression $x^3, x^5, x^7, \dots$ ($x \neq \pm 1$) is

$$\frac{x^3(1-x^{2n})}{(1-x^2)}$$

Reason: If 'a' is the first term and r is common ratio of a G.P. then sum to n terms is

$$S_n = \frac{a(r^n - 1)}{r - 1} \text{ or } = \frac{a(1 - r^n)}{1 - r} \text{ if } r \neq 1.$$

23. CASE BASED QUESTION:

A sequence of non-zero numbers is said to be a geometric progression, if the ratio of each term, except the first one, by its preceding term is always constant. Rahul, being a plant lover, decides to open a nursery and he bought few plants and pots. He wants to place pots in such a way that the number of pots in the first row is 2, in second row is 4 and in the third row is 8 and so on.....

- (a) Find the constant multiple by which the number of pots is increasing in every row (1)
 (b) Find the number of pots in 8th row. (1)
 (c) Find the difference in number of pots placed in 7th row and 5th row (2)

OR

- (c) If Rahul wants to place 510 pots in total, then find the total number of rows formed in this arrangement (2)