

Maxprap. Chapter wise Series Class 11th– Geometric Progression

Class : 11th

Subject: Mathematics

Max. Marks : 50

Duration : 2 Hrs

Sections: A (MCQs), B (Short Answer-I), C (Short Answer-II), D (Long Answer), E (Case-Based).

General Instructions:

- (i). All questions are compulsory.
- (ii). This question paper contains 23 questions divided into five Sections A, B, C, D and E. (iii). Section A comprises of 10 MCQs of 1 mark each. Section B comprises of 5 questions of 2 marks each. Section C comprises of 4 questions of 3 marks each. Section D comprises of 2 question of 5 marks each and Section E comprises of 2 Case Study Based Questions of 4 marks each.
- (iv). There is no overall choice.
- (v). Use of Calculators is not permitted.

Section A

Questions 1 to 10 carry 1 mark each

1. GM between 27 and 243 is
a) 81 b) $3\sqrt{30}$ c) 135 d) 40.5
2. The sum of an infinite geometric series is 15 and the sum of the squares of these terms is 45. The first term of the series is
a) 6 b) 7 c) 9 d) 5
3. If a, b, c are in GP then $\log a$, $\log b$, $\log c$ are in
a) H.M. b) GP c) AP d) HP
4. The 17th term of the GP $2, \sqrt{8}, 4, \sqrt{32} \dots$ is
a) 256 b) 512 c) $128\sqrt{2}$ d) $256\sqrt{2}$
5. How many terms of the GP 2, 6, 18, ... will make the sum 728?
a) 7 b) 6 c) 9 d) 8
6. $\left(1 - \frac{1}{2} + \frac{1}{4} - \frac{1}{8} + \dots \text{to 9 terms}\right) = ?$
a) $\frac{151}{196}$ b) $\frac{171}{256}$ c) $\frac{181}{256}$ d) $\frac{161}{225}$
7. Which term of the GP $\sqrt{3}, 3, 3\sqrt{3}, \dots$ is 729?
a) 13th b) 12th c) 10th d) 11th
8. If the 4th and 9th terms of a GP are 54 and 13122 respectively then its 6th term is
a) 729 b) 243 c) 486 d) 1458

Assertion(A)/Reason(R) Based (9-10): In the following questions, a statement of assertion (A) is followed by a statement of Reason (R). Choose the correct answer out of the following choices.

- a) Both A and R are true and R is the correct explanation of A.
- b) Both A and R are true but R is not the correct explanation of A.
- c) A is true but R is false.
- d) A is false but R is true.

9. Assertion (A): The sum of first 6 terms of the GP 4, 16, 64, ... is equal to 5460.

Reason (R): Sum of first n terms of the G.P is given by $S_n = \frac{a(r^n - 1)}{r - 1}$, where a = first term
r = common ratio and $|r| > 1$.

10. Assertion (A): If the numbers $\frac{-2}{7}$, K, $\frac{-7}{2}$ are in GP, then $k = \pm 1$.

Reason (R): If a_1, a_2, a_3 are in GP, then $\frac{a_2}{a_1} = \frac{a_3}{a_2}$.

SECTION – B

Questions 11 to 15 carry 2 marks each

11. The common ratio of a finite GP is 3 and its last term is 486. If the sum of these terms is 728, find the first term.

12. Determine the number of terms in G.P. $\langle a_n \rangle$, if $a_1 = 3$, $a_n = 96$ and $S_n = 189$.

13. If the first and the n^{th} term of a G.P. are a and b respectively and if P is the product of n terms, prove that $P^2 = (ab)^n$.

14. If a, b, c are in G.P. and x, y are the arithmetic means of a, b and b, c respectively, then prove that $\frac{a}{x} + \frac{c}{y} = 2$.

15. Find the values of k for which $k + 12$, $k - 6$ and 3 are in GP.

SECTION – C

Questions 16 to 19 carry 3 marks each

16. If a, b, c and d are in G.P., show that $(a^2 + b^2 + c^2)(b^2 + c^2 + d^2) = (ab + bc + cd)^2$.

17. Find the sum of the sequence 7, 77, 777, 7777, ... to n terms.

18. Find the value of n so that $\frac{a^{n+1} + b^{n+1}}{a^n + b^n}$ may be the geometric mean between a and b.

19. The AM between two positive numbers a and b ($a > b$) is twice their GM. Prove that $a : b = (2 + \sqrt{3}) : (2 - \sqrt{3})$.

SECTION – D

Questions 20 to 21 carry 5 marks each

20. If S be the sum, P be the product and R be the sum of reciprocals of n terms in a G.P, prove that $P^2 = \left(\frac{S}{R}\right)^n$.

21. Find the sum of the following series up to n terms:

- a) $5 + 55 + 555 + \dots$
- b) $6 + .66 + .666 + \dots$

SECTION – E (Case Study Based Questions)

Questions 22 & 23 carry 4 marks each

22. Read the following text carefully and answer the questions that follow:

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 a few plants with pots. He wants to place pots in such a way that the number of pots in the first row is 2, in the second row is 4 and in the third row is 8 and so on ...



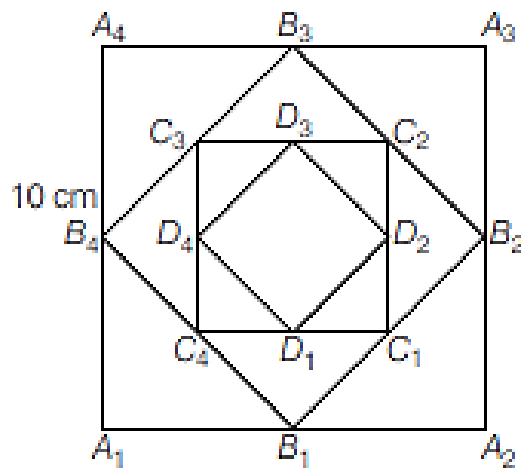
- a) Represent the above information in form of sequence name the sequence and also find the constant multiple by which the number of pots is increasing in every row? (1)
- b) If Rahul wants to place 510 pots in total, find then the total number of rows formed in this arrangement? (1)
- c) Find the total number of pots up to 10th row? (2)

OR

Find the total number of pots up to 8th row? (2)

23. Read the following text carefully and answer the questions that follow:

A student of class XI draws a square of side 10 cm. Another student joins the mid - point of this square to form a new square. Again, the mid - points of the sides of this new square are joined to form another square by another student. This process is continued indefinitely.



- Write the given information in progression and name progression. (1)
- Find the sum of areas of all the square formed is (in sq cm)? (1)
- Find the sum of the perimeter of all the square formed is (in cm)? (2)

OR

Find the sum area of 5 squares? (2)

Geometric Progression Paper Details – Analysis

Objective Questions

MCQ	1 marks x 8 question = 8	
-----	--------------------------	--

Assertion Reason	1 marks x 2 question = 2	
------------------	--------------------------	--

Subjective

Short type I	2 marks x 5 question = 10	
--------------	---------------------------	--

Short type II	3 marks x 4 question = 12	
---------------	---------------------------	--

Long Type	5 marks x 2 question = 10	
-----------	---------------------------	--

Case Studies Based

Case 1	4 marks	
--------	---------	--

Case 2	4 marks	
--------	---------	--

Total = 50 marks Your Score =