

Board – CBSE

Class – 11

Topic – Sequences and Series

Very Short Answer Type Questions (1 Mark)

1. If n^{th} term of an A.P. is $6n - 7$ then write its 50^{th} term.
2. If $S_n = 3n^2 + 2n$, then write a_2
3. Which term of the sequence, 3, 10, 17, is 136?
4. If in an A.P. 7th term is 9 and 9th term is 7, then find 16th term.
5. If sum of first n terms of an A.P is $2n^2 + 7n$, write its n^{th} term.
6. Which term of the G.P. $2, 1, \frac{1}{2}, \frac{1}{4}, \dots$ is $\frac{1}{102}$?
7. If in a G.P., $a_3 + a_5 = 90$ and if $r = 2$ find the first term of the G.P.
8. In G.P. $2, 2\sqrt{2}, 4, \dots, 128\sqrt{2}$, find the 4th term from the end.
9. If the product of 3 consecutive terms of G.P. is 27, find the middle term
10. Find the sum of first 8 terms of the G.P. $10, 5, \frac{5}{2}$
11. Find the value of $51/2 \times 51/4 \times 51/8 \dots$ up to infinity.
12. Write the value of $0.\bar{3}$
13. The first term of a G.P. is 2 and sum to infinity is 6, find common ratio.
14. Write the n^{th} term of the series, $\frac{3}{7.11^2} + \frac{5}{8.12^2} + \frac{7}{9.13^2} + \dots$
15. Find a_5 of the series whose n^{th} term is $2n + 3$.
16. In an infinite G.P., every term is equal to the sum of all terms that follow it. Find r
17. In an A.P., 8, 11, 14, find $S_n - S_{n-1}$

Short Answer Type Questions (4 Marks)

18. Write the first negative term of the sequence $20, 19\frac{1}{4}, 18\frac{1}{2}, 17\frac{3}{4}, \dots$
19. Determine the number of terms in A.P. 3, 7, 11, 407. Also, find its 11th term from the end.
20. How many numbers are there between 200 and 500, which leave remainder 7 when divided by 9.
21. Find the sum of all the natural numbers between 1 and 200 which are neither divisible by 2 nor by 5.
22. Find the sum of the sequence,

$$-1, \frac{-5}{6}, \frac{-2}{3}, \frac{-1}{2}, \dots, \frac{10}{3}$$

23. If in an A.P. $\frac{a_7}{a_{10}} = \frac{5}{7}$ find $\frac{a_4}{a_7}$
24. In an A.P. sum of first 4 terms is 56 and the sum of last 4 terms is 112. If the first term is 11 then find the number of terms.
25. Solve: $1 + 6 + 11 + 16 + \dots + x = 148$
26. The ratio of the sum of n terms of two A.P.'s is $(7n - 1) : (3n + 11)$, find the ratio of their 10th terms.
27. If the 1st, 2nd and last terms of an A.P are a, b and c respectively, then find the sum of all terms of the A.P.
28. If $\frac{b+c-2a}{a}, \frac{c+a-2b}{b}, \frac{a+b-2c}{c}$ are in A.P. then show that $\frac{1}{a}, \frac{1}{b}, \frac{1}{c}$ are also in A.P.
29. If $A = 1 + r^a + r^{2a} + \dots$ up to infinity, then express r in terms of 'a' & 'A'.
30. Insert 5 numbers between 7 and 55, so that resulting series is A.P.
31. Find the sum of first n terms of the series, $0.7 + 0.77 + 0.777 + \dots$
32. The sum of first three terms of a G.P. is 15 and sum of next three terms is 120. Find the sum of first n terms.
33. Prove that, $0.0\bar{3}1 = \frac{7}{225}$

Long Answer Type Questions (6 Marks)

34. Prove that the sum of n numbers between a and b such that the resulting series becomes A.P. is $\frac{n(a+b)}{2}$
35. A square is drawn by joining the mid points of the sides of a square. A third square is drawn inside the second square in the same way and the process is continued indefinitely. If the side of the first square is 15 cm, then find the sum of the areas of all the squares so formed.
36. If a, b, c are in G.P., then prove that $\frac{1}{a^2-b^2} = \frac{1}{b^2-c^2} - \frac{1}{b^2}$
37. Find two positive numbers whose difference is 12 and whose arithmetic mean exceeds the geometric mean by 2.
38. If a is A.M. of b and c and c, G_1, G_2, b are in G.P. then prove that $G_1^3 + G_2^3 = 2abc$
39. Find the sum of the series, $1.3.4 + 5.7.8 + 9.11.12 + \dots$ up to n terms.
40. Evaluate

$$\sum_{r=1}^{10} (2r-1)^2$$

Answer

1. 293
2. 11
3. 20th
4. 0
5. $4n + 5$
6. 12th
7. $\frac{9}{2}$
8. 64
9. 3
10. $2\left(1 - \frac{1}{2^8}\right)$
11. 5
12. $\frac{1}{3}$
13. $\frac{2}{3}$
14. $\frac{2n+1}{(n+6)(n+10)^2}$
15. 35
16. $r = \frac{1}{2}$
17. $3n + 5$
18. $-\frac{1}{4}$
19. 102, 367
20. 33
21. 7999
22. $\frac{63}{2}$
23. $\frac{3}{5}$
24. 11
25. 36
26. 33 : 17
27. $\frac{(b+c-2a)(a+c)}{2(b-a)}$

28. Hint.: Add 3 to each term

29. $\left(\frac{A-1}{A}\right)^{1/a}$

30. 15, 23, 31, 39, 47

31. $\frac{7}{81}(9n - 1 + 10^{-n})$

32. $\frac{15}{7}(2^n - 1)$

33. Hint : $0.03\bar{1} = 0.03 + 0.001 + 0.0001 + \dots$ Now use infinite G. P

35. 450 cm^2

36. Hint: Put $b = ar$, $c = ar^2$

37. 16, 4

39. $\frac{n(n+1)}{3}(48n^2 - 16n - 14)$

40. 1330