



Octahedron institute, chandan nagar

office no 2, 1st floor chandan complex

Class 10 - Mathematics

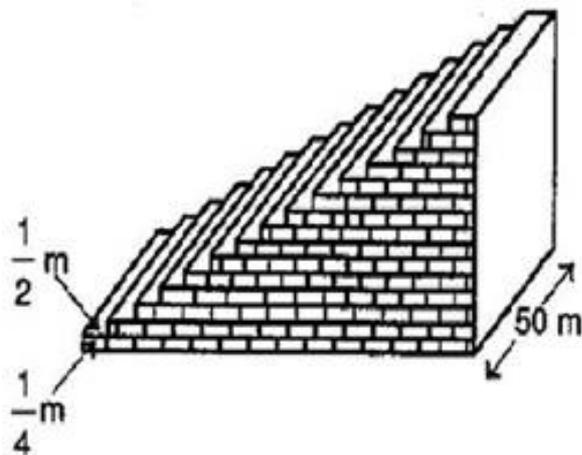
arithmetic progression

Maximum Marks: 90

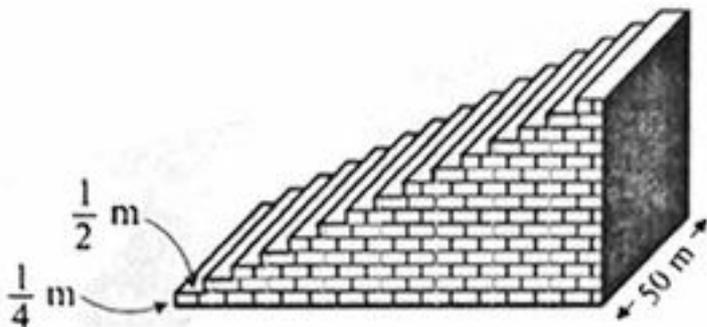
Time Allowed: 2 hours and 30 minutes

Section A

1. Write the first four terms of the AP, when the first term a and the common difference d are given as follows: $a = -2$, $d = 0$ 2
2. Which term of the sequence is $20, 19\frac{1}{4}, 18\frac{1}{2}, 17\frac{3}{4}, \dots$ the first negative term? 2
3. Find n . Given $a =$ first term $= -18.9$, $d =$ common difference $= 2.5$, $a_n =$ the n th term $= 3.6$, $n = ?$ 2
4. In an AP: $a = 3$, $n = 8$, $s = 192$, find d . 2
5. In an AP, the sum of first n terms is $\frac{3n^2}{2} + \frac{13}{2}n$ find its 2^{nd} term. 2
6. Find the sum to n term of the AP in $5, 2, -1, -4, -7, \dots$ 2
7. The 6th term of an Arithmetic progression (AP) is -10 and the 10th term is -26 . Determine the 15th term of the AP. 2
8. Find the sums given below: $34 + 32 + 30 + \dots + 10$. 2
9. The house of a row are numbered consecutively from 1 to 49. Show that there is a value of x such that the sum of the numbers of the houses preceding the house numbered x is equal to the sum of the numbers of the following it. Find this value of x . 2
10. Write first four terms of the AP, when the first term a and the common difference d are given as follows : $a = 10$, $d = 10$ 2
11. Check whether -150 is a term of the AP: $11, 8, 5, 2, \dots$ 2
12. The houses of a row are numbered consecutively from 1 to 49. Show that there is a value of x such that the sum of the numbers of the houses preceding the house numbered x is equal to the sum of the numbers of the houses following it. Find this value of x 2



13. In the following AP, find the missing terms ?, 13, ?, 3 2
14. Determine the AP whose third term is 16 and the 7th term exceeds the 5th term by 12. 2
15. If the ratio of the sums of n terms of two AP's is $n + 7 : 3n + 1$, then find the ratio the 7th terms of the series. 2
16. A small terrace at a football ground comprises of 15 steps each of which is 50 m long and built of solid concrete. Each step has a rise of $\frac{1}{4}$ m and a tread of $\frac{1}{2}$ m (see figure). Calculate the total volume of concrete required to build the terrace. 2



17. In the following situation, does the list of numbers involved make an arithmetic progression, and why? The amount of money in the account every year, when Rs 10000 is deposited at compound interest at 8% per annum. 2
18. The first term of an AP is 5, the last term is 45 and the sum is 400. Find the number of terms and the common difference. 2
19. Find the missing terms: __, 38, __, __, __, -22 2
20. Show that a_1, a_2, \dots, a_n form an AP where $a_n = 3 + 4n$. 2
21. Determine the AP whose third term is 16 and the 7th term exceeds the 5th term by 12. 2
22. In an AP: $a_{12} = 37, d = 3$, find a and S_{12} . 2
23. In the following situation, does the list of numbers involved make an arithmetic 2

progression, and why? The amount of air present in a cylinder when a vacuum pump removes $\frac{1}{4}$ of the air remaining in the cylinder at a time.

24. In an AP: $a = 2$, $d = 8$, $S_n = 90$, find n and a_n . 2
25. The 17th term of an AP exceeds its 10th term by 7. Find the common difference. 2
26. If S_n denotes the sum of first n terms of an A.P., prove that, $S_{30} = 3(S_{20} - S_{10})$. 4
27. How many multiples of 4 lie between 10 and 250? 4
28. If the sum of three numbers in AP, be 24 and their product is 440, find the numbers. 4
29. Find the 20th term from the last term of the AP : 3, 8, 13, ..., 253. 4
30. Find the middle term of the sequence formed by all three-digit numbers which leave a remainder 3, when divided by 4. Also find the sum of all numbers on both sides of the middle terms separately. 4
31. If the sum of first n th terms of an A.P. is given by $S_n = 3n^2 + 4n$. Determine the A.P. and the n th term. 4
32. The sum of the 4th and 8th terms of an AP is 24 and the sum of the 6th and 10th term is 44. Find the first three terms of the AP. 4
33. Find the sum of all natural numbers between 200 and 300 which are divisible by 4. 4
34. The sum of the third and the seventh terms of an AP is 6 and their product is 8. Find the sum of the first sixteen terms of the AP. 4
35. If the sum of n terms of an AP is $3n^2 + 5n$ and its m^{th} term is 164, find the value of m . 4