

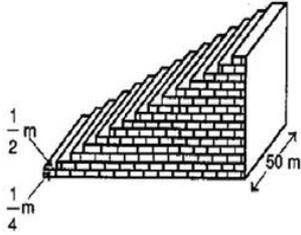
ARITHMETIC PROGRESSION WS 7

Class 10 - Mathematics

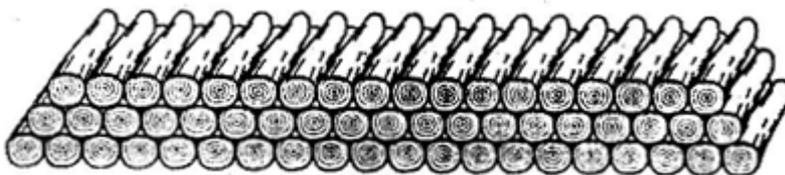
1. In an A.P. the sum of first n terms is $\frac{3n^2}{2} + \frac{13n}{2}$. Find the 25th term. [3]
2. A man saved ₹33000 in 10 months. In each month after the first, he saved ₹100 more than he did in the preceding month. How much did he save in the first month? [3]
3. In an AP, given $a = 2$, $d = 8$, $S_n = 90$. Find n and a_n . [3]
4. How many terms are there in the A.P. whose first and fifth terms are -14 and 2 respectively and if the sum of the terms is 40? [3]
5. Find the sum of the first 40 positive integers divisible by 6. [3]
6. Find the sum of first 22 terms of an AP in which $d = 7$ and 22nd term is 149. [3]
7. Find the sum of all natural numbers between 100 and 200 which are divisible by 4. [3]
8. Find the sum of all the natural numbers less than 100 which are divisible by 6. [3]
9. The sum of three numbers in A.P. is 12 and sum of their cubes is 288. Find the numbers. [3]
10. Find the sum of all 3-digit natural numbers, which are multiples of 11. [3]
11. In an A.P., if the 12th term is -13 and the sum of its first four terms is 24, find the sum of its first ten terms. [3]
12. Find the sum of the first 51 terms of the A.P. whose second term is 2 and fourth term is 8. [3]
13. In an AP, the first term is 22, n th term is -11 and sum of first n terms is 66. Find n hence find the common difference d . [3]
14. How many terms of the Arithmetic Progression 45, 39, 33, ... must be taken so that their sum is 180? Explain the double answer. [3]
15. Find the sum of first 24 terms of the list of numbers whose n th term is given by $a_n = 3 + 2n$. [3]
16. In an AP, given $a_{12} = 37$, $d = 3$. Find a and S_{12} . [3]
17. Find the sum of first n odd natural numbers. [3]
18. Two cars start together in the same direction from the same place. The first goes with uniform speed of 10 km/h. The second goes at a speed of 8 km/h in the first hour and increases the speed by $\frac{1}{2}$ km in each succeeding hour. Find after how many hours will the second car overtake the first car if both cars go non-stop. [3]
19. The 12th term of an AP is -13 and the sum of its first four terms is 24. Find the sum of its first 10 terms. [3]
20. If the sum of a certain number of terms starting from first term of an A.P. is 25, 22, 19, ..., is 116. Find the last term. [3]
21. Find the sum of all natural numbers between 100 and 500 which are divisible by 8. [3]
22. 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. [3]
23. How many terms of the AP : 9, 17, 25, must be taken to give a sum of 636? [3]
24. The sum of first n terms of an AP is given by $S_n = 3n^2 + 2n$. Find the AP. [3]
25. If $a_n = 3 - 4n$, show that a_1, a_2, a_3, \dots form an A.P. Also find S_{20} . [3]
26. A sum of ₹ 700 is to be used to give seven cash prizes to students of a school for their overall academic [3]

performance. If, each prize is ₹ 20 less than its preceding term, find the value of each of the prizes.

27. The sum of the first five terms of an AP and the sum of the first seven terms of the same AP is 167. If the sum of the first ten terms of this AP is 235, find the sum of its first 20 terms. [3]
28. 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 [3]

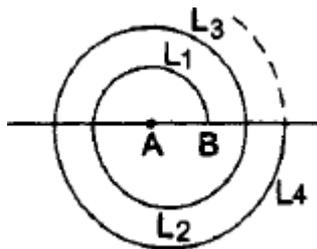


29. If the last term of an A.P. of 30 terms is 119 and the 8th term from the end (towards the first term) is 91, then find the common difference of the A.P. Hence, find the sum of all the terms of the A.P. [3]
30. In an AP, given $a_3 = 15$, $S_{10} = 125$. Find d and a_{10} . [3]
31. A contract on construction job specifies a penalty for delay of completion beyond a certain date as follows: ₹ 200 for the first day, ₹ 250 for the second day, ₹ 300 for the third day, etc; the penalty for each succeeding day being ₹50 more than for the preceding day. How much does a delay of 30 days cost the contractor? [3]
32. The tenth term of an A.P., is - 37 and the sum of its first six terms is - 27. Find the sum of its first eight terms. [3]
33. The first and the last terms of an AP are 5 and 45 respectively. If the sum of all its terms is 400, find the common difference and the number of terms. [3]
34. Find the sum of first 20 terms of an A.P., in which 3rd term is 7 and 7th term is two more than thrice of its 3rd term. [3]
35. How many terms of the A.P. $-6, -\frac{11}{2}, -5, \dots$ are needed to give the sum - 25? Explain the double answer. [3]
36. In a school, students thought of planting trees in and around the school to reduce air pollution. It was decided that the number of trees, that each section of each class will plant, will be the same as the class, in which they are studying, e.g., a section of Class I will plant 1 tree, a section of Class II will plant 2 trees and so on till Class XII. There are three sections of each class. How many trees will be planted by the students? [3]
37. In an AP, given $a = 7$, $a_{13} = 35$. Find d and S_{13} . [3]
38. Show that a_1, a_2, \dots, a_n , form an AP where $a_n = 3 + 4n$. [3]
39. If the sum of the first 14 terms of an A.P. is 1050 and its first term is 10 find its 20th term. [3]
40. 200 logs are stacked in the following manner: 20 logs in the bottom row, 19 in the next row, 18 in the row next to it and so on. In how many rows are the 200 logs placed and how many logs are in the top row? [3]



41. An AP 8,10,12, ... has 60 terms. Find its last term. Hence, find the sum of its last 10 terms. [3]
42. If S_n denotes, the sum of the first n terms of an A.P. prove that $S_{12} = 3(S_8 - S_4)$. [3]
43. Resham wanted to save at least ₹6500 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 next 12 months? Will she be able to send her daughter to the school next year? [3]

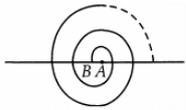
44. A spiral is made up of successive semicircles, with centres alternately at A and B, starting with centre at A, of radii 0.5 cm, 1 cm, 1.5 cm, 2 cm, ...as shown in the given figure. What is the total length of such a spiral made up of 13 consecutive semicircles? (Take $\pi = \frac{22}{7}$) [3]



45. Find the sum of two middle most terms of the A.P.: $-\frac{4}{3}, -1, -\frac{2}{3}, \dots, 4\frac{1}{3}$. [3]
46. Show that the sum of an A.P. whose first term is a, the second term is b and the last term is c, is equal to $\frac{(a+c)(b+c-2a)}{2(b-a)}$. [3]
47. In an A.P. if the first term is 22, the common difference is - 4 and the sum of n terms is 64, find n. [3]
48. Find the four numbers in A.P., whose sum is 50 and in which the greatest number is 4 times the least. [3]
49. In an A.P. the first term is 8, n^{th} term is 33 and the sum to first n terms is 123. Find n and d, the common difference. [3]
50. Find the sum of all two-digit natural numbers which are divisible by 4. [3]
51. Find the sum of the first 15 multiples of 8. [3]
52. The sum of first n terms of three arithmetic progressions are S_1, S_2 and S_3 respectively. The first term of each A.P. is 1 and common differences are 1, 2 and 3 respectively. Prove that $S_1 + S_3 = 2S_2$ [3]
53. Find the number of terms of the A.P. - 12, - 9, - 6,, 21. If 1 is added to each term of this A.P., then find the sum of all the terms of the A.P. obtained. [3]
54. A man saved ₹16500 in ten years In each year after the first he saved ₹100 more than he did in the preceding year. How much did he save in the first year? [3]
55. The ratio of the sums of first m and first n terms of an A.P. is $m^2 : n^2$. Show that the ratio of its m^{th} and n^{th} terms is $(2m - 1):(2n - 1)$. [3]
56. The common difference of an A.P. is -2. Find its sum, if first term is 100 and last term is -10. [3]
57. Find the number of terms of the AP -12, -9, -6, ..., 21. If 1 is added to each term of this AP then find the sum of all terms of the AP thus obtained. [3]
58. The sum of first n terms of three AP's are S_1, S_2 and S_3 . The first term of each AP is unity and their common difference is 1, 2 and 3, respectively. Prove that $S_1 + S_3 = 2 \times S_2$. [3]
59. In an AP, given $a_n = 4, d = 2, S_n = -14$. Find n and a. [3]
60. In an AP, given $a = 8, a_n = 62, S_n = 210$. Find n and d. [3]
61. Given that in an A.P., the sum of first n terms is $\frac{3n^2}{2} + \frac{5n}{2}$. Find its 25th term. [3]
62. The sum of first 7 terms of an A.P. is 63 and sum of its next 7 terms is 161. Find 28th term of A.P. [3]
63. If the sum of the first 14 terms of an A.P. is 1050 and its first term is 10, then find the 21st term of the A.P. [3]
64. Find the sum of all natural numbers less than 200 which are divisible by 5. [3]
65. In an A.P., if the 5^{th} and 12^{th} terms are 30 and 65 respectively, what is the sum of first 20 terms? [3]
66. The sum of the first 7 terms of an AP is 63 and the sum of its next 7 terms is 161. Find the 28th term of this AP. [3]
67. 150 workers were engaged to finish a piece of work in a certain number of days. Four workers dropped the second day, four more workers dropped the third day and so on. It takes 8 more days to finish the work now. [3]

Find the number of days in which the work was completed.

68. A spiral is made up of successive semi-circles with centres alternately at A and B starting with A, of radii 1 cm, 2 cm, 3 cm,.... as shown in the figure. What is the total length of spiral made up of eleven consecutive semi-circles? [3]



69. Find the sum of first 51 terms of an AP whose second and third terms are 14 and 18 respectively. [3]
70. The sum of n terms of an AP whose first term is 5 and common difference is 36 is equal to the sum of $2n$ terms of another AP whose first term is 36 and common difference is 5. Find n . [3]
71. In an AP, given $d = 5$, $S_9 = 75$. Find a and a_9 . [3]
72. If the 8th term of an AP is 37 and the 15th term is 15 more than the 12th term. Find the AP. Hence find the sum of first 15 terms of the AP. [3]
73. If 12th term of an AP is 213 and the sum of its four terms is 24, then find the sum of its first 10 terms. [3]
74. Find the sum of first seventeen terms of A.P. whose 4th and 9th terms are -15 and -30 respectively. [3]
75. If the ratio of the sums of first n terms of two A.P.'s is $(7n + 1) : (4n + 27)$, find the ratio of their m^{th} terms. [3]