

ARITHMETIC PROGRESSION WS 4

Class 10 - Mathematics

1. Find the number of integers between 50 and 500 which are divisible by 7. [3]
 2. If sum of the 3rd and the 8th terms of an AP is 7 and the sum of the 7th and the 14th terms is -3 , find the 10th term. [3]
 3. The digits of a positive three digit number are in A.P and their sum is 15. The number obtained by reversing the digits is 594 less than the original number. Find the number. [3]
 4. Determine the AP whose third term is 16 and the 7th term exceeds the 5th term by 12. [3]
 5. Find the term of the arithmetic progression 9, 12, 15, 18,... which is 39 more than its 36th term. [3]
 6. The ratio of the 11th term to the 18th term of an AP is 2:3. Find the ratio of the 5th term to the 21st term, and also the ratio of the sum of the first 5 terms to the sum of first 21 terms. [3]
 7. Find the common difference of an AP whose first term is 5 and the sum of its first four terms is half the sum of the next four terms. [3]
 8. For the A.P.: -3, -7, -11,..., can we find $a_{30} - a_{20}$ without actually finding a_{30} and a_{20} ? Give reasons for your answer. [3]
 9. The 17th term of an AP exceeds its 10th term by 7. Find the common difference. [3]
 10. If the mth term of an AP be $\frac{1}{n}$ and its nth term be $\frac{1}{m}$, then show that its (mn)th term is 1. [3]
 11. How many three-digit number are divisible by 7? [3]
 12. For what value of n are the nth terms of the following two APs the same 13,19,25, ...and 69,68,67,...? Also, find this term. [3]
 13. The sum of the 4th and 8th terms of an AP is 24 and the sum of the 6th and 10th terms is 44. Find the first three terms of the AP. [3]
 14. In an A.P., the sum of first n terms is $\frac{n}{2}(3n + 5)$. Find the 25th term of the A.P. [3]
 15. Prove that the 11th term of an A.P. cannot be $n^2 + 1$. Justify your answer. [3]
 16. Check whether -150 is a term of the AP: 11, 8, 5, 2, [3]
 17. Find the 20th term of an A.P. whose 3rd term is 7 and the seventh term exceeds three times the 3rd term by 2. Also, find its nth term (a_n). [3]
 18. In the AP, ?, 13, ?, 3 find the missing terms? [3]
 19. Find the 31st term of an AP whose 11th term is 38 and the 16th term is 73. [3]
 20. The sum of first three terms of an AP is 48. If the product of first and second terms exceeds 4 times the third term by 12. Find the AP. [3]
- HINT** Let these angles be x° , $(x + 10)^\circ$, $(x + 20)^\circ$ and $(x + 30)^\circ$. Their sum is 360° .
21. The angles of a quadrilateral are in AP whose common difference is 10° . Find the angles. [3]
- HINT** Let these angles be x° , $(x + 10)^\circ$, $(x + 20)^\circ$ and $(x + 30)^\circ$. Their sum is 360° .
22. Suba Rao started work in 1995 at an annual salary of ₹5000 and received a ₹200 raise each year. In what year did his annual salary will reach ₹7000? [3]

23. For what value of n , are the n th terms of two APs: 63, 65, 67, and 3, 10, 17, equal? [3]
24. Find the sum of first 16 terms of the A.P. whose n^{th} term is given by $a_n = 5n - 3$. [3]
25. If 9^{th} term of an A.P. is zero, prove that its 29^{th} term is double the 19^{th} term. [3]
26. Find four numbers in AP whose sum is 28 and the sum of whose squares is 216. [3]
27. The sum of 5^{th} and 9^{th} terms of an A.P. is 72 and the sum of 7th and 12th terms is 97 .Find the A.P. [3]
28. Find the middle term(s) of the A.P. 7, 13,19,...., 241. [3]
29. If p^{th} term of an A.P. is q and the q^{th} term is p , show that its n^{th} term is $(p + q - n)$. [3]
30. If the m^{th} term of an A.P. be $1/n$ and n th term be $1/m$, then show that its $(mn)^{\text{th}}$ term is 1. [3]
31. Tanvy joined her job in a company in the year 2015 on a monthly salary of ₹40000 with an annual increment of ₹2500. In which year will she get ₹65000 as monthly salary? [3]
32. A sum of Rs 700 is to be used in give seven cash prizes to students of a school for their overall academic performance. If each prize is Rs 20 less than its preceding prize, find the value of each of the prizes. [3]
33. If m times the m^{th} term of an Arithmetic Progression is equal to n times its n^{th} term and $m \neq n$, show that the $(m + n)^{\text{th}}$ term of the A.P. is zero. [3]
34. Find the 31^{st} term of an AP whose 11^{th} term is 38 and 16^{th} term is 73. [3]
35. Determine an A.P. whose third term is 9 and when fifth term is subtracted from 8th term, we get 6. [3]
36. Find the missing terms: __, 38, __, __, __, -22 [3]
37. A sum of ₹2800 is to be used to award four prizes. If each prize after the first is ₹200 less than the preceding prize, find the value of each of the prizes. [3]
38. The 7^{th} term of an AP is -4 and its 13^{th} term is -16. Find the AP. [3]
39. Two A.P.s have the same common difference. The first term of one A.P. is 2 and that of the other is 7. The difference between their 10th terms is the same as the difference between their 21st terms, which is the same as the difference between any two corresponding terms. Why? [3]
40. Find the sum of the first 25 terms of an A.P. whose n^{th} term is given by $a_n = 7 - 3n$. [3]
41. The sum of first n terms of an A.P is given by $S_n = 3n^2 - 4n$. Determine the A.P. and the 12th term. [3]
42. Determine the general term of an A.P. whose 7^{th} term is -1 and 16^{th} term 17. [3]
43. If the 10^{th} term of an AP is 52 and 17^{th} term is 20 more than its 13^{th} term, find the AP. [3]
44. If $\frac{a^{n+1}+b^{n+1}}{a^n+b^n}$ is the A.M between a and b . Then, find the value of n . [3]
45. Yasmeen saves Rs 32 during the first month, Rs 36 in the second month and Rs 40 in the third month. If she continues to save in this manner, in how many months will she save Rs 2000? [3]
46. If an A.P. consists of n terms with first term a and n^{th} term l show that the sum of the m^{th} term from the beginning and the m^{th} term from the end is $(a + l)$. [3]
47. An AP consists of 21 terms. The sum of the three terms in the middle is 129 and of the last three is 237. Find the AP. [3]
48. How many terms are there in the A.P. $-1, -\frac{5}{6}, -\frac{2}{3}, -\frac{1}{2}, \dots, \frac{10}{3}$ [3]
49. Which term of the AP : 121, 117, 113, is the first negative term? [Hint : Find n for $a_n < 0$] [3]
50. For what value of n are the n th terms of the following two A.P's the same? [3]
- i. 1, 7, 13, 19, ...
- ii. 69, 68, 67,

51. The production of TV sets in a factory increases uniformly by a fixed number every year. It produced 16000 sets in 6th year and 22600 in 9th year. Find the production during first year. [3]
- 8th year
 - first 6 years.
52. Determine the Arithmetic Progressions whose third term is 16 and the 7th term exceeds the 5th term by 12. [3]
53. Which term of the AP : 3, 15, 27, 39, will be 132 more than its 54th term? [3]
54. Find an AP whose 4th term is 9 and the sum of its 6th and 13th terms is 40. [3]
55. The eighth term of an A.P. is half of its second term and the eleventh term exceeds one third of its fourth term by 1. Find the 15th term. [3]
56. The 4th term of an A.P. is three times the first term and the 7th term exceeds twice the third term by 1. Find the first term and the common difference. [3]
57. The 2nd, 31st and the last term of an AP are $7\frac{3}{4}$, $\frac{1}{2}$ and $-6\frac{1}{2}$, respectively. Find the first term and the number of terms. [3]
58. The 24th term of an A.P. is twice its 10th term. Show that its 72nd term is 4 times its 15th term. [3]
59. A sum of ₹ 1000 is invested at 8% simple interest per year. Calculate the interest at the end of each year. Do these interests form an AP? If so, find the interest at the end of 30 years making use of this fact. [3]
60. The 10th term of an A.P. is 52 and 16th term is 82. Find the 32nd term and the general term. [3]
61. The sum of three terms of an A.P. is 21 and the product of the first and the third terms exceeds the second term by 6, find three terms. [3]
62. The sum of three consecutive terms of an AP is 21 and the sum of the squares of these terms is 165. Find these terms. [3]
63. Two A.P's have the same common difference. The difference between their 100th terms is 111222333. What is the difference between their Millionth terms? [3]
64. The 4th term of an AP is zero. Prove that its 25th term is triple its 11th term. [3]