CBSE

ARITHMETIC PROGRESSION WS 8

Class 10 - Mathematics

Section A

1. Find the sum of first 100 even natural numbers which are divisible by 5. **[2]**
2. Find the sum of all the two digit numbers which leave the remainder 2 when divided by 5. **[2]**
3. Let there be an A.P. with first term 'a', common difference 'd'. If a_n denotes its n^{th} term and S_n the sum of first n terms, find. a, if $a_n = 28$, $S_n = 144$ and n = 9. **[2]**
4. In an AP, the first term is 2, the last term is 29 and the sum of all the terms is 155. Find the common difference. **[2]**
5. a_1, a_2,a_3, ..., a_{24} are in AP and $a_1 + a_5 + a_{10} + a_{15} + a_{20} + a_{24} = 300$. Find the sum of first 24 terms of the AP. **[2]**
6. In an A.P, if $S_n = 3n^2 + 5n$ and $a_k = 164$, find the value of k. **[2]**
7. Find the sum of the first 15 terms of sequences having n^{th} term as $b_n = 5 + 2n$. **[2]**
8. Find the sum of first 20 terms of an A.P. whose n^{th} term is given as $a_n = 5 - 2n$. **[2]**
9. Find the sum of first n terms of an AP whose nth term is (5n -1). Hence, find the sum of first 20 terms. **[2]**
10. Find the sum: $\frac{a-b}{a+b} + \frac{3a-2b}{a+b} + \frac{5a-3b}{a+b} + \ldots$ to 11 terms. **[2]**
11. The sum of n terms of an AP is $3n^2 + 5n$. Find the AP. Hence, find its 16^{th} term. **[2]**
12. Find the sum of the first twelve 2-digit numbers which are multiples of 6. **[2]**
13. Find the sum of all three-digit numbers each of which leaves the remainder 2, when divided by 3. **[2]**
14. If S_n, the sum of first n terms of an AP is given by $S_n = 3n^2 - 4n$, find the nth term. **[2]**
15. Find the sum of the first 40 positive integers divisible by 5. **[2]**
16. Find the sum of last ten terms of the A.P.: 8,10,12,14,.., 126. **[2]**
17. Find the sum of the first 25 terms of an AP, whose n^{th}term is given by $a_n = 7 - 3n$. **[2]**
18. Find the sum of n terms of AP where $a_n = 5 - 2n$. **[2]**
19. 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]**
20. In an A.P. of 50 terms, the sum of the first 10 terms is 210 and the sum of its last 15 terms is 2565. Find the A.P. **[2]**
21. Find the sum of the A.P. 50,46,42,... to 10 terms. **[2]**
22. Show that a_1, a_2, ..., a_n , form an AP where $a_n = 9 - 5n$. **[2]**
23. Find the sum: $4 - \frac{1}{n} + 4 - \frac{2}{n} + 4 - \frac{3}{n} +$ ...upto n terms. **[2]**
24. Find the sum of n terms of the series $\sqrt{2} + \sqrt{8} + \sqrt{18} + \sqrt{32} + \ldots$ **[2]**
25. The fourth term of an A.P. is 11. The sum of the fifth and seventh terms of the A.P. is 34. Find the common difference. **[2]**
26. Find the common difference of an A.P. whose first term is 8, the last term is 65 and the sum of all its terms is 730. **[2]**
27. Find the sum of all three-digit natural numbers which are divisible by 13. **[2]**

28. Find the sum of all multiples of 5 lying between 101 and 999. **[2]**

29. If the 77^{th} term of a sequence is 3 - 2n. Find the sum of fifteen terms. **[2]**

30. Sum of the first 14 terms of an A.P. is 1505 and its first term is 10. Find its 25^{th} term. **[2]**

31. The sum of first six terms of an arithmetic progression is 42. The ratio of its 10th term to its 30th term is 1 : 3. Calculate the first and the thirteenth term of the A.P. **[2]**

32. For an AP with common difference 6, the sum of first ten terms is same as four times the sum of first five terms. Determine the first term of the AP. **[2]**

33. How many numbers lie between 10 and 300, which when divided by 4 leave a remainder 3? **[2]**

34. Find the sum of all natural numbers between 200 and 400 which are divisible by 7. **[2]**

35. How many terms of the A.P: –15, –13, –11,.... are needed to make the sum –55? Explain the reason for the answer **[2]**

36. Find the sum of first 17 terms of an AP whose 4th and 9th terms are –15 and –30 respectively. **[2]**

37. Find the sum of first 30 terms of AP: -30, -24, -18, ... **[2]**

38. Find the common difference of an AP whose first term is 4, the last term is 49 and the sum of all its terms is 265. **[2]**

39. If the sum of the first 7 terms of an A.P. is 49 and that of the first 17 terms is 289, find the sum of its first n terms. **[2]**

40. Find the common difference **d** of an AP whose first term is 10 and the sum of the first 14 terms is 1505. **[2]**

41. Show that the sum of all terms of an A.P. whose first term is a the second term is b and the last term is c is equal to $\frac{(a+c)(b+c-2a)}{2(b-a)}$. **[2]**

42. Rohan repays his total loan of ₹ 1,18,000 by paying every month starting with the first instalment of ₹ 1,000. If he increases the instalment by ₹ 100 every month, what amount will be paid by him in the 30^{th} instalment? What amount of loan has he paid after 30^{th} instalment? **[2]**

43. Show that the sum of first n even natural numbers is equal to $(1 + \frac{1}{n})$ times the sum of the first n odd natural numbers. **[2]**

Section B

Question No. 44 to 47 are based on the given text. Read the text carefully and answer the questions: **[4]**

Students of a school 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.

44. Find total number of trees planted by primary 1 to 5 class students?

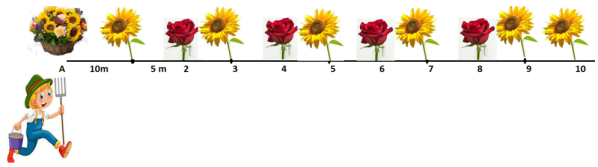
45. Find the total number of trees planted by the students of the school.

46. Find the total number of trees planted by class 10th student.

47. Find the total no of trees planted by class 12^{th} students.

Question No. 48 to 51 are based on the given text. Read the text carefully and answer the questions: **[4]**

In a school garden, Dinesh was given two types of plants viz. sunflower and rose flower as shown in the following figure.



The distance between two plants is to be 5m, a basket filled with plants is kept at point A which is 10 m from the first plant. Dinesh has to take one plant from the basket and then he will have to plant it in a row as shown in the figure and then he has to return to the basket to collect another plant. He continues in the same way until all the flower plants in the basket. Dinesh has to plant ten numbers of flower plants.

48. Write the above information in the progression and find first term and common difference.
49. Find the distance covered by Dinesh to plant the first 5 plants and return to basket.
50. Find the distance covered by Dinesh to plant all 10 plants and return to basket.
51. If the speed of Dinesh is 10 m/min and he takes 15 minutes to plant a flower plant then find the total time taken by Dinesh to plant 10 plants.

Question No. 52 to 55 are based on the given text. Read the text carefully and answer the questions: **[4]**

Your elder brother wants to buy a car and plans to take loan from a bank for his car. He repays his total loan of ₹ 1,18,000 by paying every month starting with the first instalment of ₹ 1000. If he increases the instalment by ₹ 100 every month , answer the following:

52. Find the amount paid by him in 30^{th} installment.
53. Find the amount paid by him in 30 installments.
54. If total installments are 40 then amount paid in the last installment?
55. Find the 10^{th} installment, if the 1^{st} installment is of ₹ 2000.

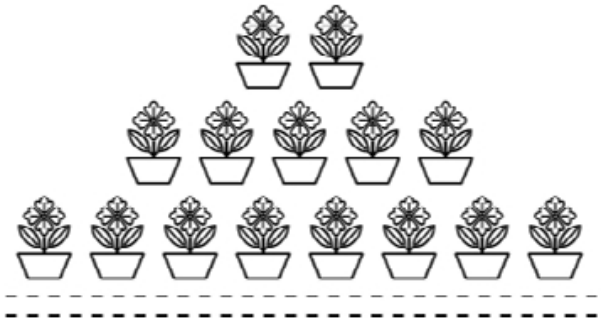
Question No. 56 to 59 are based on the given text. Read the text carefully and answer the questions: **[4]**

In a potato race, a bucket is placed at the starting point, which is 5 m from the first potato, and the other potatoes are placed 3 m apart in a straight line. There are ten potatoes in the line. A competitor starts from the bucket, picks up the nearest potato, runs back with it, drops it in the bucket, runs back to pick up the next potato, runs to the bucket to drop it in, and she continues in the same way until all the potatoes are in the bucket. What is the total distance the competitor has to run?

56. Find the terms of AP formed in above situation.
57. What is the total distance the competitor has to run?
58. Find distance cover after 4 potato drop in the bucket?
59. Find the distance covered by competitor in order to put 5^{th} potato in the bucket.

Question No. 60 to 63 are based on the given text. Read the text carefully and answer the questions: **[4]**

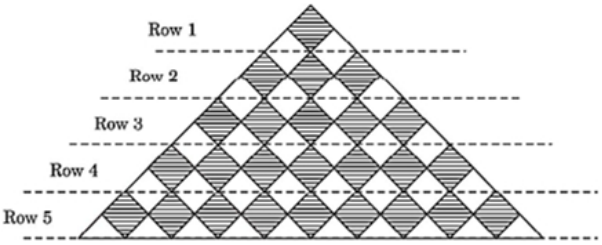
Aahana being a plant lover decides to convert her balcony into beautiful garden full of plants. She bought few plants with pots for her balcony. She placed the pots in such a way that number of pots in the first row is 2, second row is 5, third row is 8 and so on.



60. Find the number of pots placed in the 10^{th} row.
61. Find the difference in the number of pots placed in 5^{th} row and 2^{nd} row.
62. If Aahana wants to place 100 pots in total, then find the total number of rows formed in the arrangement.
63. If Aahana has sufficient space for 12 rows, then how many total number of pots are placed by her with the same arrangement?

Question No. 64 to 67 are based on the given text. Read the text carefully and answer the questions: **[4]**

A fashion designer is designing a fabric pattern. In each row, there are some shaded squares and unshaded triangles.



64. Identify A.P. for the number of squares in each row.
65. Identify A.P. for the number of triangles in each row.
66. If each shaded square is of side 2 cm, then find the shaded area when 15 rows have been designed.
67. Write a formula for finding total number of triangles in n number of rows. Hence, find S_{10}.

Question No. 68 to 71 are based on the given text. Read the text carefully and answer the questions: **[4]**

Saving money is a good habit and it should be inculcated in children from the beginning. Mrs. Pushpa brought a piggy bank for her child Akshar. He puts one five-rupee coin of his savings in the piggy bank on the first day. He increases his savings by one five-rupee coin daily.

68. If the piggy bank can hold 190 coins of five rupees in all, find the number of days he can contribute to put the five-rupee coins into it
69. Find the total money he saved.
70. How much money Akshar saves in 10 days?
71. How many coins are there in piggy bank on 15th day?

Question No. 72 to 75 are based on the given text. Read the text carefully and answer the questions: **[4]**

Sehaj Batra gets pocket money from his father every day. Out of pocket money, he saves money for poor people in his locality. On 1st day he saves ₹27.5 On each succeeding day he increases his saving by ₹2.5.

72. Find the amount saved by Sehaj on 10^{th} day.

73. Find the amount saved by Sehaj on 25^{th} day.

74. Find the total amount saved by Sehaj in 30 days.

75. Find in how many days Sehaj saves ₹1400.