MATHS

BOOKS - NAVNEET PUBLICATION

ARITHMETIC PROGRESSION

Solved

1. Which of the following sequences are A.P.? If they A.P. find the common difference.

2, 4, 6, 8. . . . .

2. Which of the following sequences are A.P.? If they A.P. find the common difference.

$$2, \frac{5}{2}, 3, \frac{7}{2}. \ . \ ..$$

3. Which of the following sequences are A.P.? If they A.P. find the common difference.

`-10,-6,-2,2....

4. Following sequences is in A.P.? If A.P. find the common difference.

$0.3, 0.33, 0.333, \ldots$

5. Which of the following sequences are A.P.? If they A.P. find the common difference.

`0,-4,-8,-12,...

6. Which of the following sequences are A.P.? If they A.P. find the common difference.

$$-\frac{1}{5}, \ -\frac{1}{5}, \ -\frac{1}{5}, \ \ldots$$

7. Which of the following sequences are A.P.? If they A.P. find the common difference.

$$3, \ 3 + \sqrt{2}, \ 3 + 2\sqrt{2}, \ 3 + 3\sqrt{2}, \ \ldots.$$

8. Which of the following sequences are A.P.? If they A.P. find the common difference.

$127, 132, 137, \ldots$

9. Write an A.P. whose first term is a and common difference is d in each of the following:

$a = 10, d = 5$

10. Write an A.P. whose first term is a and common difference is d in each of the following:

$a = -3, d = 0$

11. Write an A.P. whose first term is a and common difference is d in each of the

following:

$$a = -7, d = \frac{1}{2} i. \; e.0.5$$

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12. Write an A.P. whose first term is a common

difference is d in each of the following.

$$a = -1.25, d = 3$$

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13. Write an A.P. whose first term is a and common difference is d in each of the following:

$a = 6, d = -3$

14. Write an A.P. whose first term is a and common difference is d in each of the following:

$a = -19, d = -4$

15. Find the first term and common difference for the A.P. $5, 1, -3, -7$

16. Find the first term and common difference for the A.P. $0.6, 0.9, 1.2, 1.5$

17. Find the first term and common difference for the A.P. 127, 135, 143, 151, . . .

18. Find the first term and common difference for the A.P. $\frac{1}{4}, \frac{3}{4}, \frac{5}{4}, \frac{7}{4}$

19. Write the correct number in the given blanks from the following A.P.1, 8, 15, 22.

$a = \ldots$ $t_1 = \ldots, t_2 = \ldots, t_3 = \ldots$

$t_2 - t_1 = \ldots$ and $t_3 - t_2 = \ldots,$ hence

$d = \ldots$

20. Write the correct number in the given blanks from the following A.P. 3, 6, 9, 12.

$a = \ldots$ $t_1 = \ldots, t_2 = \ldots, t_3 = \ldots$

$t_2 - t_1 = \ldots$ and $t_3 - t_2 = \ldots,$ hence

$d = \ldots$

21. Write the correct number in the given blanks from the following A.P.

$-3, -8, -13, -18.$ $\qquad$ $a = \ldots$

$t_1 = \ldots, t_2 = \ldots, t_3 = \ldots$

$t_2 - t_1 = \ldots$ and $t_3 - t_2 = \ldots,$ $\qquad$ hence

$d = \ldots$

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22. Write the correct number in the given blanks from the following A.P.70, 60, 50, 40.

$a = ...$ $t_1 = ...$, $t_2 = ...$, $t_3 = ...$

$t_2 - t_1 = ...$ and $t_3 - t_2 = ...$,   hence

$d = ...$

23. Decide whether following sequence is an A.P.,if so find $20th$ term of the progression.

$-12, \; -5, 2, 9, 16, 23, 30...$

24. Find the $25th$ term of A.P

12, 16, 20, 24, ...

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25. Find the $19th$ term of the following A.P.

7, 13, 19, 25, . . .

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26. Find the $27th$ term of the following A.P.

$9, 4, -1, -6, -11, \ldots.$

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27. How many three digit natural numbers are divisible by 5?

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28. The 11th term and the 21st term of an A.P are 16 and 29 respectively,then find the 41st term of that A.P.

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29. Which term of the A.P.

`11,8,5,2,... is -151?

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30. How many natural numbers from 10 to 250 are divisible by 4?

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31. In an A.P $17th$ term is 7 more than $10th$ term. Find the common difference?

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32. Derive the formula for the nth term of the sequence of odd natural numbers and even naturals numbers.The difference between any two cosecutive odd or even natural numbers is 2, i.e. d=2.

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33. Find the sum of the first n natural numbers.

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34. Find the sum of the first n odd natural numbers

▶ **Watch Video Solution**

35. Find the sum of the first n even natural numbers

▶ **Watch Video Solution**

36. Find the sum of all odd numbers from 1 to 150.

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37. The first term of an A.P. is 6 and the common difference 3. Find S_27= ?

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38. Find the sum of the first 123 even natural numbers.

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39. Find the sum of all even numbers between 1 and 350.

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40. In an A.P. 19th term is 52 and 38th term is 128. Find the sum of first 56 terms.

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41. Find the sum of natural numbers from 1 to 140 which are divisible by 4.

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42. Sum of first 55 terms in an A.P is 3300. Find its $28th$ term.

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43. In an A.P sum of three consecutive terms is 27 and their product is 504, find the terms. (Assume that three consecutive terms in A.P are $a - d, a, a + d$).

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44. Find four consecutive terms in an A.P.whose sum is 12 and the sum of $3rd$ and $4th$ term is 14. (Assume the four consecutive terms in A.P are $a - d, a, a + d, a + 2d$).

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45. If the $9th$ term of an A.P is $zero$ then show that the $29th$ term is twice the $19th$ term.

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46. On 1st January 2016, Sanika decides to save ₹10, ₹11 on second day, ₹12 on third day. If she decides to save like this, then on 31st December 2016 what would be her total saving?

47. A man borrows ₹8000 and agrees to repay with a total interest of ₹1360 in 12 monthly installments, each installment being less than

the preceding one by ₹40. Find the amount of the first and last installment.

48. Sachin invested in a national saving certificate scheme. In the 1st year, he invested ₹5000, in 2nd year ₹7000, in 3rd year ₹9000 and so on. Find the total amount he invested in 12 years.

49. There is an auditorium with 27 rows of seats. There are 20 seats in the first row, 22 seats in the second row, 24 seats in the third row and so on. Find the number of seats in 15th row and the total seats in the auditorium.

50. Kargil's temperature was recorded for a week i.e Monday to Saturday. All readings were in A.P .The sum of temperatures of Monday and Saturday was $5°C$ more than the sum of

temperatures of Tuesday and Saturday. If temperature of Wednesday was $-30°C$, then find the temperature on the other five days.

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51. On the World Environment Day tree plantation programme was arranged on a land which is triangular in shape. Trees are planted such that in the first row there is one tree, in the second row there are two trees, in the

third row there are three trees and so on.

Then find the total number of trees in 25 rows.

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52. Choose the correct alternative answer for each of the following subquestions:

The sequences -10,-6,-2,2,.....

    A. is an A.P. reason d=-16

    B. is an A.P, reason d=4

    C. is an A.P, reason d=-4

D. is not an A.P.

Answer:

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53. Choose the correct alternative answer for each of the following subquestions:

The first four terms of A.P. having the first term -2 and the common difference -2 are...

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54. Choose the correct alternative answer for each of the following subquestions:

What is the sum of the first 30 natural numbers?

   A. 464

   B. 465

   C. 462

   D. 461

Answer:

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55. Choose the correct alternative answer for each of the following subquestions:

For an A.P. if $t_7=4, d=-4$, then a=....

A. 6

B. 7

C. 20

D. 28

Answer:

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56. Choose the correct alternative answer for each of the following subquestions:

For an A.P. if a= 3.5, d=0, n=101, then tn=.....

A. 0

B. 3.5

C. 103.5

D. 104.5

Answer:

57. Choose the correct alternative answer for each of the following subquestions:

For an A.P. , the first two terms are -3.4 . The 21st term is....

A. -143

B. 143

C. 137

D. 17

Answer:

58. Choose the correct alternative answer for each of the following subquestions:

If for an A.P. d=5, then $t_{18}-t_{13}$=.......

A. 5

B. 20

C. 25

D. 30

Answer:

59. Choose the correct alternative answer for each of the following subquestions:

The sum of the first five multiples of 3 is.....

A. 45

B. 55

C. 15

D. 75

Answer:

60. Choose the correct alternative answer for each of the following subquestions:

The sum of the first ten terms of the A.P. 15,10,5,.....is....

A. -75

B. -125

C. 75

D. 125

Answer:

61. Choose the correct alternative answer:

The first term of an A.P. is 1 and nth term is 20.

If $S_n = 399$, then $n = ?$

A. (a) 42

B. (d) 38

C. (c) 21

D. (d) 19

Answer:

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62. Find the fourth term fro m the end of the

A.P. -11,-8,-5,.....,49.

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63. In an A.P $10th$ term is 46, sum of $5th$ term and $7th$ term is 52. Find the A.P.

64. Find the sum of the first ten terms of the A.P. whose 4th term is-15 and 9 th termis -30.

65. Two A.P's are given as $9, 7, 5, \ldots$ and $24, 21, 18, \ldots$ If nth term of both the progressions are equal then find the value of n and nth term.

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66. If sum of $3rd$ and $8th$ term of an A.P is 7 and sum of $7th$ and $14th$ term is -3, then find $10th$ term.

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67. In an A.P, first term is -5 and last term is 45. If sum of all the numbers in the A.P is 120, then how many terms are there? What is the common difference?

68. Sum of 1 to n natural numbers is 36. Find the value of n.

69. Divide 207 in three parts, such that all parts are in A.P and product of two smaller parts is 4623.

70. There are 37 terms in an A.P. The sum of three terms placed exactly at the middle is 225 and the sum of last three terms is 429. Write the A.P.

71. If first term of an A.P is a, second term is b and last term is c, then show that sum of all the terms is $\dfrac{(a+c)(b+c-2a)}{2(b-a)}$.

72. If the sum of first p terms of an A.P is equal to the sum of first q terms, then show that the sum of its first $(p+q)$ terms is $zero.(p \neq q)$.

73. If m times the mth term of an A.P is equal to n times its nth term then show that $(m+n)th$ term of the A.P is $zero$.

74. ₹1000 is invested at 10% simple interest. Check at the end of every year if the total interest amount is in A.P. If this is an A.P then find interest amount after 20 years.

1. Solve : $1 + 5 + 9 + \ldots + x = 1770$

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2. How many numbers are there from 10 to 300 which when divided by 4 leave the remainder 3?

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3. Choose the correct alternative from those given below each question:

What is the sum of first n natural numbers?

    A. [n(n-1)]/2

    B. [n(n+1)]/2

    C. n/2(n-2)

    D. [n(n+2)]/2

Answer:

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4. Choose the correct alternative from those given below each question:

The first four terms of an A.P. having the first term -7 and the common difference 3 are .

5. Choose the correct alternative from those given below each question:

Which of the following is the sum of the first 10 natural numbers?

A. 11

B. 20

C. 65

D. 55

Answer:

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6. Choose the correct alternative from those given below each question:

For an A.P. , if $t_n = 24, n = 12, d = 2$, then what is the value of a?

A. 2

B. 1

C. 12

D. 24

Answer:

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7. Choose the correct alternative from those given below each question:

What is the 16th term of an A.P. whose first two terms are 100,105?

A. 195

B. 185

C. 175

D. 165

Answer:

8. Choose the correct alternative from those given below each question:

If for an A.P. d=10, what is $t_6 - t_2$?

A. 10

B. 20

C. 30

D. 40

Answer:

9. Choose the correct alternative from those given below each question:

Which of the following are the terms of an A.P.?

A. 1 , 3 , 6 , 10 , ...

B. 3 , 6 , 12 , 24 , ...

C. 28 , 26 , 24 , 22,....

D. 4 , 2 , 3 , 1 , ...

Answer:

10. Choose the correct alternative from those given below each question:

What is the sum of first 10 terms of the A.P. `15,10,5...?

A. -75

B. -125

C. 75

D. 125

Answer:

11. Choose the correct alternative from those given below each question:

For an A.P. if a=2 and d= 2.5 the which is the seventh term?

A. 17

B. 15

C. 13

D. 11

Answer:

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12. Choose the correct alternative:

For an A.P., $t_1 = 2, t_n = 41$ and $S_n = 860$.

What is the value of n?

A. (a) 31

B. (b) 30

C. (c) 41

D. (d) 40

Answer:

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13. Choose the correct alternative from those

given below each question:

For an A.P. if a=3,d=5, what is the value of t_11?

A. 53

B. 58

C. 85

D. 35

Answer:

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14. Choose the correct alternative from those given below each question:

For an A.P. a=1 and d=4. What is the value of n ,

if t_n=81?

A. 22

B. 21

C. 20

D. 19

Answer:

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15. Choose the correct alternative from those given below each question:

Which of the following sequences are in A.P.?

(i)1,3,6,10...

(ii)3,8,13,18,....

(iii)7,4,1,-2,...

(iv)-10,13,-16,19,...

    A. (i) and ii

    B. ii and iii

    C. iii and iv

D. iv and i

Answer:

16. Choose the correct alternative from those given below each question:

What is the common difference (d) of the A.P. $2, -2, -6, -10...$?

A. -4

B. 2

C. -2

D. 4

Answer:

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17. Choose the correct alternative:

The first term of an A.P. is 1 and nth term is 25.

If $S_n = 520$, then $n = $ . . ..

A. (a) 45

B. (b) 30

C. (c) 50

D. (d) 40

Answer:

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18. Find the first terem of the sequence:

$$t_n = 3n + 1$$

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19. Find the first terem of the sequence:

$$t_n \frac{1}{n^2} - 1$$

20. Find the first terem of the sequence:

$$t_n = 4n - 3$$

21. Write the next two terms of an A.P. , if a=11 and d=2.

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22. Find the second and third terms of an A.P. whose first term is -2 and yhe common difference is -2.

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23. Find S_3 for the A.P. 3, 5, 7, 9, ...

24. What is the 6th term of the sequence `3,5,8,12,17?

25. For the given A.P. write the values of a and d.

$400, 360, 320, . . .$

26. For the given A.P. write the values of a and d.

$5, 12, 19, ...$

27. For the given A.P. write the values of a and d.

`2,-2,-6,....

28. Write the 2nd and 3rd terms of the A.P., if

$a = 10, d = 5$

29. Write the 2nd and 3rd terms of the A.P., if

$a = -12, d = -4$

30. If for an A.P., $d=20$, what is the value of $t_6 - t_2$?

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31. What is the value of d for an A.P., if $t_3=12$ and $t_7=36$?

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32. If for an A.P, the 1st term is 2 and the 10th term is 48, then what is the sum of the first 10 terms?

33. For an A.P. 8 th term is 17. Write an equation relating a and d.

34. Write the two missing terms of the A.P.,

12, 19, 26, ..., 40, . . .

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35. Which of the following sequence are A.P.?

1, 3, 6, 10, ...

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36. Which of the following sequence are A.P.?

1, 4, 7, 10, . . .

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37. Which of the following sequence are A.P.?

22, 26, 28, 31, . . .

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38. Which of the following sequence are A.P.?

$-10, \ -13, \ -16, \ -19, \ldots$

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39. The nth term of the A.P.`3,8,13,18,... is 148. Find n.

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40. Write the next four terms of the A.P. 2, 5, 8, 11, . . .

41. The first term and the common difference of an A.P. are 12 and 4 respectively. If $t_n = 96$, find n.

42. The first term of an A.P is -3 and the $10th$ term is 15 Find S_{10}.

43. For an A.P. if $S_{10} = 150$ and $S_9 = 126$, find t_{10}.

44. Find the 23rd term of the A.P,

$9, 4, -1, -6, \ldots$

45. Find the common difference of the A.P. if

$a = 100$ and $t_{20} = 176$.

46. Find t_{12} for the A.P, $12, 9, 6, \ldots$

47. There are 25 rows of seats in an auditorium. The 1st row is of 20 seats , the 2nd row of 22 seats , the 3rd row of 24 seats and so on. How many seats are there in the 21st row ?

48. Find the sum of the first 100 natural numbers.

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49. Find the sum of the first 50 even natural numbers.

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50. Find the sum of the first 25 odd natural numbers.

51. For an A.P, $t_6 = -10$ and $t_{14} = -34$. Find the value of t_{10}.

52. For an A.P, a=25 and t_20=500 . Find the common difference d.

53. How many two digit numbers are divisible by 4?

54. The first term of an A.P. is 5 and the common differences is 4. Complete the following activity to find the sum of first 12 terms of the A.P.

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55. Find the sum of first 1000 positive integers.

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56. Which term of the A.P. 3, 11, 19, 27, . . . is 547?

57. How many two -digit numbers are there divisible by 3?

58. Find t_n for the A.P. 3, 8, 13, 18, . . .

59. Is the sequence -10,-4,2,8,... an A.P.? Find the 31st term,if it is an A.P.

60. Find the value of $t_7 + t_9$ for the A.P. 7, 13, 19, 25, ...

61. Which term of the A.P. 50, 40, 30, 20, ... Is the number -940?

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62. Find S_15, if for an A.P. a=10 and d=3.

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63. Find S_10, for an A.P. 0,1/6,1/3,....`

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64. The sum of the 3rd and 7th terms of an A.P. is 6 and their product is 8. Find the 1st term (a) and the common difference (d) of the A.P.

65. Find the sum of all natural numbers between 1 and 145 which are divisible by 4.

66. Find S_{30}, if the first term of an A.P. is 10 and the common difference 5.

67. Sachin invested some amount in National Savings certificates in a specific way. In the first year, he invested Rs 4000, in the second year Rs 6000, in the third year Rs 8000 and so on for 12 years . Find the total amount he invested in 12 years.

68. Find the sum of the first 100 terms of the A.P. 12, 14, 16, 18, ...

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69. Open ended question :

Write an A.P. in which a=10 and d is any positive number. Find S_10 of this A.P. can -80 be a term in thi A.P.? Give reason.

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70. Amit saves certain amount every month in a specific way in the first month he saves Rs 200, in the second month Rs 250, in the third month Rs 300 and so. On. How much will be his savings in 17 months?

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71. If the 9th and 21st terms of an A.P. are 75 and 183 respectively, find its 81st term.

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72. Find the sum of even numbers between 1 to 300.

73. The sum of 45 terms of an A.P. is 3195. Find its 23rd term.

74. The sum of three consecutive terms of an A.P. is 30 and their product is 360. Find the terms.

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75. The sum of four consecutive terms of an A.P. is 2. The sum of the 3rd and 4th terms is 11. Find the terms.

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76. One person borrows Rs 4000 and agrees to repay with a total interest of Rs 500 in 10 instalments. Each instalment is less than the preceding instalment by Rs 10 . What would be the first and last instalments?

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