



MATHS

BOOKS - CHETANA MATHS (MARATHI ENGLISH)

Arithmetic Progression

Example

1. Show the position of the terms by $t_1, t_2, t_3,$
for sequence 9,15, 21,...



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2. Show the position of the terms by t_1, t_2, t_3 ,
for sequence $7, 7, 7, 7, \dots$



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3. Show the position of the terms by t_1, t_2, t_3 ,
for sequence $-2, -2, -10, -16, \dots$



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4. Check whether there is any rule among the terms of sequence: 1, 4, 7, 10, 13. . .



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5. Check whether there is any rule among the terms of sequence: 6, 12, 18, 24, . . .



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6. Check whether there is any rule among the terms of sequence: 3, 3, 3, 3. . . .



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7. Check whether there is any rule among the terms of sequence: 4, 16, 64,



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8. Check whether there is any rule among the terms of sequence:

$-1, -1.5, -2, -2.5, \dots$



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9. Write one example of finite and infinite A.P. each.



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10. Is the given sequence an AP? If yes, then find common difference: 2, 4, 6, 8,



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11. Is the given sequence an AP? If yes, then find common difference: 2, $\frac{5}{2}$, 3, $\frac{7}{3}$,



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12. Is the given sequence an AP? If yes, then

find common difference:

$-10, -6, -2, 2, \dots$



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13. Is the given sequence an AP? If yes, then

find common difference: $0.3, 0.33, 0.333, \dots$



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14. Is the given sequence an AP? If yes, then

find common difference:

$$0, -4, -8, -12, \dots$$



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15. Is the given sequence an AP? If yes, then

find common difference:

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



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16. Is the given sequence an AP? If yes, then find common difference:

$$3, 3 + \sqrt{2}, 3 + 2\sqrt{2}, 3 + 3\sqrt{2}, \dots$$



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17. Is the given sequence an AP? If yes, then find common difference: 127, 132, 137, ...



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18. Write an A.P whose first term is $a = 2$ and common difference is $d = 5$ upto 4 terms.



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19. Write an A.P whose first term is $a = -3$ and common difference is $d = 0$ upto 4 terms.



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20. Write an A.P whose first term is $a = -7$ and common difference is $d = \frac{1}{2}$ upto 4 terms.



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21. Write an A.P whose first term is $a = -1.25$ and common difference is $d = 3$ upto 4 terms.



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22. Write an A.P whose first term is $a = 6$ and common difference is $d = -3$ upto 4 terms.



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23. Write an A.P whose first term is $a = -19$ and common difference is $d = -4$ upto 4 terms.



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



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



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



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27. Find the first term and common difference

for the A.P. $\frac{1}{4}, \frac{3}{4}, \frac{5}{4}, \frac{7}{4}$



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28. Is 5, 8, 11, 14... an A.P? If so then what will be the 100th term ? Check whether 92 and 61 are in this A.P.



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

$$a = \dots \quad t_1 = \dots, t_2 = \dots, t_3 = \dots$$

$$t_2 - t_1 = \dots \text{ and } t_3 - t_2 = \dots, \quad \text{hence}$$

$$d = \dots$$





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

$$a = \dots \quad t_1 = \dots, t_2 = \dots, t_3 = \dots$$

$$t_2 - t_1 = \dots \quad \text{and} \quad t_3 - t_2 = \dots, \quad \text{hence}$$

$$d = \dots$$



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

$$-3, -8, -13, -18.$$

$$a = \dots$$

$$t_1 = \dots, t_2 = \dots, t_3 = \dots$$

$$t_2 - t_1 = \dots \text{ and } t_3 - t_2 = \dots, \quad \text{hence}$$

$$d = \dots$$



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

$$a = \dots \quad t_1 = \dots, t_2 = \dots, t_3 = \dots$$

$$t_2 - t_1 = \dots \text{ and } t_3 - t_2 = \dots, \quad \text{hence}$$

$$d = \dots$$



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33. Decide whether following sequence is an A.P.,if so find 20^{th} term of the progression.

$-12, -5, 2, 9, 16, 23, 30, \dots$



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34. For the given Arithmetic Progression

$12, 16, 20, 24, \dots$.Find the 24^{th} term of this AP.



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35. Find the 19th term of the following A.P.

7, 13, 19, 25, ...



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36. Find the 27th term of the following A.P.

9, 4, - 1, - 6, - 11, ...



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37. Find the 4th term from the end in an A.P,

$-11, -8, -5, \dots, 49$



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38. 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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39. In an A.P 10^{th} term is 46, sum of 5^{th} term and 7^{th} term is 52. Find the A.P.



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40. If sum of 3^{rd} and 8^{th} term of an A.P is 7 and sum of 7^{th} and 14^{th} term is -3 , then find 10^{th} term.



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41. In an A.P 17^{th} term is 7 more than 10^{th} term. Find the common difference?



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



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



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44. 11, 8, 5, 2, ..., In this A.P which term is number -151 ?



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



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



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



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



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49. First term and common difference of an A.P are 6 and 3 respectively. Find S_{27}



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



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51. An A.P has its 4^{th} term as -15 and 9^{th} term as -30 . Find the sum of first 10 numbers.



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



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53. Find the sum of all even natural numbers between 1 to 350.



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



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55. Sum of first 55 terms in an A.P is 3300. Find its 28^{th} term.



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



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57. 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?



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58. 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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59. 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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60. Divide 207 in three parts, such that all parts are in A.P and product of two smaller parts is 4623.



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61. 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.



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62. 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*. ($p \neq q$).



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63. 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 $\frac{(a + c)(b + c - 2a)}{2(b - a)}$.



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64. 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.



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65. 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 $5^{\circ}C$ more than the sum of temperatures of Tuesday and Saturday. If

temperature of Wednesday was $-30^{\circ}C$, then find the temperature on the other five days.



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66. ₹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.



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67. 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?



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68. 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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69. 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.



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70. 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.



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Exercise

1. The sequence $-10, -6, -2, 2, \dots$ 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.

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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2. First four terms of an A.P are....., whose first term is -2 and common difference is -2 .

a) $-2, 2, 2, 4$ b) $-2, 4, -8, 16$ c)

$-2, -4, -6, -8$ d) $-2, -4, -8, -16$

A. $-2, 2, 2, 4$

B. $-2, 4, -8, 16$

C. $-2, -4, -6, -8$

D. $-2, -4, -8, -16$

Answer:



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3. What is the sum of first 30 natural numbers? a)464 b)465 c)462 d)461

A. 464

B. 465

C. 462

D. 461

Answer:



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

$a = \dots\dots\dots$ a)6 b)-7 c)20 d)28

A. 6

B. -7

C. 20

D. 28

Answer:



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5. For a given AP, $a = 3.5$, $d = 0$, $n = 101$ then

$t_n = \dots\dots\dots$ a)0 b)103.5 c)104.5 d)3.5

A. 0

B. 3.5

C. 103.5

D. 104.5

Answer:



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6. In an A.P, first two terms are $-3, 4$, then 21st term is.....a) -143 b) 143 c) 131 d) 137

A. -143

B. 143

C. 137

D. 17

Answer:



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7. If for an A.P, $d = 5$ then $t_{18} - t_{13} = \dots\dots\dots$ a)5

b)20 c)25 d)30

A. 5

B. 20

C. 25

D. 30

Answer:



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**8. Sum of first five multiples of 3 is.....a)45 b)15
c)55 d)35**

A. 45

B. 55

C. 15

D. 75

Answer:



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9. 15, 10, 5, In this A.P the sum of first 10 terms is.....a) – 75 b) – 125 c)75 d)125

A. – 75

B. – 125

C. 75

D. 125

Answer:



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10. In an A.P, 1st term is 1 and the last term is 20. The sum of all terms is 399, then $n = \dots$

a)42 b)38 c)21 d)19

A. 42

B. 38

C. 21

D. 19

Answer:



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11. For the A.P: 4, 9, 14. t_{11} =....a)49 b)54 c)59 d)44

A. 49

B. 54

C. 59

D. 44

Answer:



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12. If $a = 6$, $d = 3$, then $S_{10} = \dots$. a) 192 b) 195 c) 198 d) 201

A. 192

B. 195

C. 198

D. 201

Answer:



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13. The sum of first 10 natural numbers is a)
55 b)155 c)310 d)210

A. 55

B. 155

C. 310

D. 210

Answer:



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14. Which of the following sequence is not an

A.P? a)0.5, 2, 3.5, 5, b)3, 5, 7, 9, c)

22, 26, 28, 31, d)1, 4, 7, 10,

A. 0.5, 2, 3.5, 5,

B. 22, 26, 28, 31,

C. 3, 5, 7, 9,

D. 1, 4, 7, 10,

Answer:



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15. Find the missing term in the A.P:

$-5, \dots, 13$ a)1 b)4 c)2 d)3

A. 1

B. 2

C. 3

D. 4

Answer:



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16. Find the t_2 of the sequence for which

$S_1 = 2$, $S_2 = 12$ and $S_3 = 30$ a)24 b)1 c)23 d)

10

A. 24

B. 2

C. 10

D. none of these

Answer:



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17. For an A.P if $t_4 = 12$ and $d = -10$, then find a . a) -18 b) 42 c) -5 d) 21

A. -18

B. 42

C. -5

D. 21

Answer:



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18. The next two terms of the given sequence
1, 3, 7, 15, 31..... are: a)42, 54 b)62, 124 c)
64, 128 d)63, 127

A. 42,54

B. 62124

C. 64128

D. 63127

Answer:



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19. In an A.P, $a = 8$, $t_n = 62$, $S_n = 210$, then find n . a)5 b)6 c)7 d)8

A. 5

B. 6

C. 7

D. 8

Answer:



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20. The sum of first n terms of an A.P. is

$S_n = \dots\dots\dots$ a) $\frac{n}{2}[t_1 + t_n]$ b)

$\frac{n}{2}[2 + (n - 1)d]$ c) $\frac{n}{2}[2 + (n - 1)d]$ d) None

of these

A. $\frac{n}{2}[t_1 + t_n]$

B. $\frac{n}{2}[a + (n - 1)d]$

C. $\frac{n}{2}[2 + (n - 1)d]$

D. none of these

Answer:



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21. A meeting hall has 30 rows in all. There are 20 seats in the first row, 24 seats in the second row and 28 seats in the third row and so on. How many seats are there in the hall? a)136 b) 4640 c)2340 d)192

A. 136

B. 4640

C. 2340

D. 192

Answer:



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22. State whether the given sequence is an A.P

or not : $1^3, 2^3, 3^3, 4^3, 5^3, \dots$ a)A.P with

$d = 3$ b)Not an A.P c)A.P with $d = 7$ d)Can't

say

A. an A.P with $d=3$

B. Not an A.P

C. A.P with $d = 7$

D. can't say

Answer:



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23. Is the following sequence Arithmetic Progression? If it is an A.P then write common difference: 0, 1, 0, 1, 0, 1,



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24. Is the following sequence an Arithmetic progression? If it is an A.P then write common difference. $-10, -13, -16, -19, \dots$



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25. Is following sequence an Arithmetic progression? If it is an A.P then write common difference: $1^3, 2^3, 3^3, 4^3, \dots$



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26. Is the following sequence an Arithmetic progression? If it is an A.P then write common difference: 31, 26, 21, 15,



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27. Is the following sequence is an Arithmetic progression? If it is an A.P then write common difference: $-1, -\frac{3}{2}, -2, -\frac{5}{2}, \dots$



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28. Write an A.P where the common difference d and the first term a are: $a = 11, d = 1.5$



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29. Write an A.P where the common difference d and the first term a are $a = 5, d = -5$



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30. Write an A.P where the common difference d and the first term a is given:

$$a = -8, d = 0$$



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31. Write an A.P where the common difference d and the first term a is given:

$$a = -3.5, d = -3.5$$



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32. Write an A.P where the common difference d and the first term a is given:

$$a = 10, d = -3$$



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33. How many terms are there in the A.P
187, 194, 201, , 439?



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34. Find n , if the n th term of the following sequence is 68: 5, 8, 11, 14, . . .



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35. If the 10th term and the 18th term of an A.P are 25 and 41 respectively, then find the 38th term.



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36. How many three digit natural numbers are divisible by 4?



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37. Find the 18th term of the A.P 1, 7, 13, 19.



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38. Find t_{11} for the following A.P: 4, 9, 14,



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39. Find the 10^{th} term from the end of the A.P:

4, 9, 14, , 254



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40. For which value of n the n^{th} terms of the following two A.Ps are equal?

23, 25, 27, 29 and $-17, -10, -3, 4, \dots$



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41. The 6^{th} term of an A.P is 5 times the 1^{st} term and the 11^{th} term exceeds twice the 5^{th} term by 3. Find the 8^{th} term.



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42. How many two digit natural numbers are divisible by 5?



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43. Obtain the sum of 56 terms of an A.P whose 19th and 38th term are 52 and 148 respectively.



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44. In an A.P, the 5th and 12th terms are 30 and 65 respectively. What is the sum of the first 20 terms?



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45. Split 69 in three parts such that they are in A.P and product of two smaller parts is 483. Find the three parts.



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46. The first and the last terms of an A.P are 17 and 9. If common difference is -2 , then find the number of terms and their sum.



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47. Find four consecutive terms in an A.P such that the sum of the middle two terms is 18 and product of the terminal terms is 45.



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48. Find three consecutive terms in an A.P whose sum is -3 and the product of their cubes is 512.



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49. How many terms of the A.P: 9, 17, 25, ... must be taken to give a sum of 636?



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50. Find the sum of all natural numbers between 100 and 1000 which are multiples of 7 .



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51. A meeting hall has 20 seats in the first row, 24 seats in the second row, 28 seats in the third row and so on and has in all 30 rows. How many seats are there in the meeting hall?



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52. In winter, the temperature at a hill station from Monday to Friday is in A.P. The sum of the temperatures of Monday, Tuesday and Wednesday is zero and the sum of the

temperatures of Thursday and Friday is $15^{\circ}C$.

Find the temperature of each of the five days.



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53. Neeta saves in a Mahila Bachat Gat ₹2 on the first day, ₹4 on the second day, ₹6 on the third day and so on. What will be her saving in the month of February, 2010?



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54. Mr. Shah borrows ₹4000 and agrees to repay with a total interest of ₹500 in 10 installments, each installment being less than the preceding installment by ₹10. What is the first and the last installment?



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55. A farmer borrows ₹1000 and agrees to repay with a total interest of ₹140 in 12 installments, each installment being less than

the preceding installment by ₹10. What should be the first installment?



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56. The sequence $-10, -6, -2, 2, \dots$

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

A. is an A,P Reason $d=-16$

B. ia 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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57. Sum of first five multiples of 3 is. . . a)45 b)

55 c)15 d)75

A. 45

B. 55

C. 15

D. 75

Answer:



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58. For an A.P.: $2, -2, -6, -10, \dots$ find d .

a) -4 b) 2 c) 4 d) 1



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59. For an A.P, if $a = -3$ and $d = 4$, then find t_n .



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60. Determine whether following sequence is an A.P : $2, -2, -6, -10, \dots$



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61. In an A.P, $a = 6$ and $d = 3$. Then find S_{27} .



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62. Find the 19^{th} term of the following A.P.

7, 13, 19, 25, ...



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



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64. Number of literate people in the year 2010 is 4000. This number increases by 400 every year. How many literate people will exist in the year 2020?



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



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66. If the sum of p terms of an A.P is equal to the sum of q terms, then show that the sum of its $p + q$ terms is zero.



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67. Mr. Ajay borrows ₹3,25,000. He paid ₹30,500 in the first month and then each installment being less than the preceding installment by

₹1500 he pays the rest. How long will it take to clear his loan?



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68. 200 logs of wood 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 200 logs are placed and how many logs are there in the top row?



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69. If sum of m terms is n and sum of n terms is m , then show that the sum of $(m + n)$ terms is $-(m + n)$.



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70. How many terms of the A.P $16, 14, 12, \dots$ Are needed to obtain the sum 60 ? Explain why we get two answers.



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71. If p th, q th and r th terms of an A.P. are l, m, n respectively, show that

$$(q - r)l + (r - p)m + (p - q)n = 0$$



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72. Jinal saves ₹1600 during first year, ₹2100 in the second year, ₹2600 in the third year, if she continues her saving in this pattern, in how many years will she save ₹38,500?



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73. Find the middle term of sequence formed by all three digit numbers which leave a remainder 3 when divided by 4. Also find sum of all numbers on both sides of the middle term.



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