MATHS

BOOKS - BAL BHARTI

ARITHMETIC PROGRESSION

Solved Examples

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

$1, 4, 7, 10, \ldots$

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

$1, 4, 7, 10, \ldots$

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

$1, 4, 7, 10, \ldots$

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

$1, 4, 7, 10, \ldots$

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

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

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

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

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9. Find t_n for following A.P., and then find 30th term of A.P.

3,8,13, 18,.....

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10. Which of the following is not an A.P?

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11. What is the mean of 3, 5, 7, 9, 11, 13, 15?

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

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13. 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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14. Find the sum of the first n natural numbers.

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

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

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

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18. The population of a city increases at the rate 3% per year.

If at time t the population of city is p, then find equation of p in time t.

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19. The population of a city increases at the rate 3% per year.

If at time t the population of city is p, then find equation of p in time t.

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20. The population of a city increases at the rate 3% per year.

If at time t the population of city is p, then find equation of p in time t.

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21. 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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22. 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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23. 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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24. 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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Practice Set 3 1

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

127, 132, 137,.....

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

$127, 132, 137, \ldots$

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

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

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

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

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

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

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

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

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

127, 132, 137,.....

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

127, 132, 137,.....

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

$a = 10, d = 5$

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

$a = -3, d = 0$

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

following:

$a = 6, d = -3$

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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:

$a = 6, d = -3$

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

$a = -19, d = -4$

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

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

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

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

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Practice Set 3 2

1. Find the square roots of the following: 18i

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2. Find the square roots of the following: 3-4i

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3. Find the square roots of the following: 3-4i

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4. Find the square roots of the following: 3-4i

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

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

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6. For the given Arithmetic Progression $12, 16, 20, 24, \ldots$.Find the 24th term of this AP.

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7. Find the $19th$ term of the following A.P. $7, 13, 19, 25, \ldots$

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8. Find the $27th$ term of the following A.P. $9, 4, -1, -6, -11, \ldots$.

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

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10. 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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11. $11, 8, 5, 2, \ldots$, In this A.P which term is number -151 ?

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

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

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Practice Set 3 3

1. First term and common difference of an A.P are $6 \text{ and } 3$ respectively. Find S_{27}

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

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

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

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

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6. 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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7. 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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8. 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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Practice Set 3 4

1. 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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2. 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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3. 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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4. 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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5. 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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6. 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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Problem Set 3 Choose The Correct Alternative Answer For Each Of The Following Sub Questions

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

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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, 0, 2, 4

B. -2, 4, -8, 16

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

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

Answer: C

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3. 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: B

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4. For a given A.P., $t_7 = 4,\ d = -4$ then $a = \ldots\ldots\ldots$ a)6 b)-7 c)20 d)28

A. 6

B. 7

C. 20

D. 28

Answer: D

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5. 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: B

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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: C

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7. If for an A.P, $d = 5$ then $t_{18} - t_{13}$=.....a)5 b)20 c)25 d30

A. 5

B. 20

C. 25

D. 30

Answer: C

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8. 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: A

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9. $15, 10, 5, \ldots\ldots$ 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: A

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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 $n = \ldots$.

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

A. 42

B. 38

C. 21

D. 19

Answer: B

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Problem Set 3

1. Find the 4th term from the end in an A.P, $-11,\ -8,\ -5, \ldots, 49$

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

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3. An A.P has its $4th$ term as -15 and $9th$ term as -30. Find the sum of first 10 numbers.

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4. 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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5. 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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6. 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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7. Sum of 1 to n natural numbers is 36. Find the value of n.

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8. 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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9. 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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10. 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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11. 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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12. 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 $zero$.

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13. ₹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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