MATHS

BOOKS - CHETAN MATHS (TAMIL ENGLISH)

ARITHMETIC PROGRESSION

Example

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

Master Key Question Set Practice Set 3 1

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

2,4,6,8,...

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

$2, \dfrac{5}{2}, 3, \dfrac{7}{3}, \ldots$

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

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

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

0.3,0.33,0.333, ...

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

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

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

$$-\frac{1}{5}, \; -\frac{1}{5}, \; -\frac{1}{5}, \; ...$$

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7. Which of the following squences are A.P.? If they are A.P. find the common difference 3,

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

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8. Which of the following squences 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 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 d in each of the following.

a = -3, d= 0

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

$a = -7, d = \dfrac{1}{2}$

12. write an A.P. whose first term is a and common difference 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 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 d in each of the following.

a= -19, d = -4

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15. Find the first term and common difference for each of the A.P.

5,1,-3,-7

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16. Find the first term and common difference for each of the A.P.

0.6,0.9,1.2,1.5,.....

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17. Find the first term and common difference for each of the A.P.

127,135,143,151,....

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18. Find the first term and common difference for each of the A.P.

$$\frac{1}{4}, \frac{3}{4}, \frac{5}{4}, \frac{7}{4}, \ldots$$

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Master Key Question Set Practice Set 3 2

1. Write the correct common difference from the following A.P. 1,8,15,22,...

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2. Write the correct common difference from the following A.P. 3,6,9,12,....

3. Write the correct common difference from the following A.P. -3, -8, -13, -18

4. Write the correct common difference from the following A.P. 70,60,50,40,.....

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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. Given Arithmetic Progression 12,16,20,24, ...

Find the 24th term of this progression.

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

7, 13, 19, 25, ...

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

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

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

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

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11. How many three-digit numbers are divisible by 5 ?

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Master Key Question Set Practice Set 3 3

1. In the natural numbers from 10 to 250, how many are divisible by 4?

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

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3. If the 9th term of an A.P. is zero, then prove that 29th term is double of 19th term.

4. If m times the mth term of an A.P. is equal to n times its nth term, show that the $(m+n)^{th}$ term of the A.P. is zero.

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

6. Find the sum of first 123 even natural number.

7. Find the sum of all even number between 1 to 350.

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

9. Sum of first 55 terms in an A.P.is 3300,find its

28th term.

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10. In an A.P. 19th term is 52 and 38th term is

128, Find sum of first 56 terms.

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11. In an A.P. the sum of three consecutive terms is 27 and their product is 504. Find the terms. (Consider the terms to be in ascending order.)

12. Find four consecutive terms in an A.P. whose sum is 12 and the sum of 3rd and 4th term is 14.

(Let four consecutive terms be a -d ,a,a+d, a+2d)

Master Key Question Set Practice Set 3 4

1. 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 also find how many total seats are there in the auditorium?

2. Kargil's temperature was recorded in a week from Monday to Saturday. All readings were in A.P. The sum of temperatures of Monday and Saturday was $5 \circ C$ more than sum of temeratures of Tuesday and Saturday. If temperature of Wednesday was $-30 \circ C$ Then find the temperature on the other five days.

3. On 1st Jan 2018, Sanikadecides to save Rupees 10,Rupees 11 on the second day, Rupees 12 on the third day . She decides to save like this . What would be her total savings at the end of the year ?

4. 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 tree, in the third row three trees and so on. Find the total number of trees in 25 rows.

5. Sachin invested in a National Saving Certificate scheme. In the 1th year, he invested ₹5000, in 2nd year ₹7000, in 3rd year ₹9000

and so on. Find the total amount that he invested in 12 years.

6. A man borrows ₹ 8000 and agrees to repay with a total interest of ₹ 1360 in 12 monthly installments. Each installment is being less than the preceding one by ₹40. Find the amount of the first and last installment.

1. The 4th term from the end of an AP -11, -8, -5, ..., 49 is

A.

B.

C.

D.

Answer: ∴ Fourth term from end given A.P. is 40

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

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

4. Two A.P's are given 9,7,5..and 24,21,18,.....If n^{th} term of both the progressions are equal then find the value of n and n^{th} term

5. The A.P. in which 4th term -15 and 9th term is -30. Find the sum of first 10 numbers.

6. Sum of 1 to n natural numbers is 36, then find the value of n.

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7. 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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8. Split 207 into three parts such that these are in A.P. and the product of the two smaller parts is 4623.

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9. An AP consists of 37 terms. The sum of the three middle most terms is 225 and the sum of the last three terms is 429. Find the AP

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10. If the $S_p = S_q$ [sum of first 'p' and 'q' terms] $(p \neq q)$ Show that sum of its first (p+q) terms is:

11. Show that the sum of an A.P. whose first term is a, the second term is b and the last term is c, is equal to `((a+c)(b+c−2a))/(2(b−a))`

12. ₹1000 is invested at 10 percent simple interest. Check at the end of every year if the total interest amount is in A.P. If this is an A.P. the find interest amount after 20 years. For this complete the following activity.

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Problem Set 3 Mcq

1. The sequence -10,-6,-2,2,.... Is

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. The first four terms of an Ap whose first term is -2 and the common difference is -2 are

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. What is the the sum of first 30 natural numbers? A)464 B)465 C)462 D)461

A. 464

B. 465

C. 462

D. 461

Answer: B

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

$a = \ldots.$

A. 6

B. -7

C. 2-

D. 28

Answer: D

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

$t_n = \ldots$

A. 0

B. 3.5

C. 103.5

D. 104.5

Answer: B

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6. If the first two terms of an A.P. Are -3 and 4,

then what is the 21st term of this A.P. ?

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

D. 30

Answer: C

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8. The sum of first five multiples of 3 is

A. 45

B. 55

C. 15

D. 75

Answer: A

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

A. -75

B. -125

C. 75

D. 125

Answer: A

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

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 Additional Mcqs

1. For an A.P. 4, 9,14,.... t_{11} = ...

A. 49

B. 54

C. 59

D. 44

Answer: B

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2. If a = 6, d= 3 then S_{10} = ... A)192 B)195 C)198

D)201

A. 192

B. 195

C. 198

D. 201

Answer: B

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3. The sum of first 10 natural numbers.

A. 55

B. 155

C. 310

D. 210

Answer: A

4. Which of the following sequenece is not an

A.P.?

A. 0.5,2,3.5,5 ...

B. 22,26,28,31 ...

C. 3,5,7,9, ...

D. 1,4,7,10....

Answer: B

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5. Find the missing term in the A.P.: -5, ... ,13

A)1 B)2 C)3 D)4

A. 1

B. 2

C. 3

D. 4

Answer: D

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6. Find the t_2 of the following sequence for which $S_1 = 2$, $S_2 = 12$ and $S_3 = 36$ A)24 B)2 C)10 D)none of these

A. 24

B. 2

C. 10

D. none of these

Answer: C

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7. 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: B

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8. The next two terms of the given sequene 1, 3, 7, 15, 31,... A)4254 B)62124 C)64128 D)63127

A. 42,54

B. 62124

C. 64128

D. 63127

Answer: D

9. In an AP: (i) given a = 5,d=3, a_n = 50, find n

and S_n . (ii) given a = 7, a_{13} = 35, find d and S_{13} .

(iii) given a_{12} = 37, d= 3, find a and S_{12} . (iv)

given a_3 = 15, S_{10} = 125, find d and a_{10} . (v)

given d = 5, `S_

A. 5

B. 6

C. 7

D. 8

Answer: B

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10. The sum of first n terms of an A.P. S_n = ...A)

$\dfrac{n}{2}[t_1 + t_n]$ B)$\dfrac{n}{2}[a + (n - 1)d]$ C)

$\dfrac{n}{2}[2 + (n - 1)d]$ D)none of these

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

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

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

D. none of these

Answer: A

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11. 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

Answer: C

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12. State whether the given sequence is an A.P. or not: $1^3, 2^3, 3^3, 4^3, 5^3, \ldots\ldots$ A)anA.P. with d = 3 B)not an A.P. C)an A.P. with d = 7 D)can't say

    A. anA.P. with d = 3

    B. not an A.P.

    C. an A.P. with d = 7

    D. can't say

Answer: B

Problems For Practice

1. Which of the following sequence are Arithmetice progression ? If it is an A.P. then write common difference.

0,1,0,1,0,1,...

2. Which of the following sequence are Arithmetice progression ? If it is an A.P. then write common difference.

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

3. Which of the following sequence are Arithmetice progression ? If it is an A.P. then write common difference.

$1^3, 2^3, 3^3, 4^3, \ldots$

4. Which of the following sequence are Arithmetice progression ? If it is an A.P. then write common difference.

31,26,21,15,....

5. Which of the following sequence are Arithmetice progression ? If it is an A.P. then

write common difference.

$$-1, \frac{-3}{2}, -2, -\frac{5}{2}, \ldots\ldots$$

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6. Write an A.P. when the common differnce d and the first term a are given.

a = 11, d = 1.5

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7. Write an A.P. when the common differnce d and the first term a are given.

a = 5,d = -5

8. Write an A.P. when the common differnce d and the first term a are given.

a = -8, d = 0

9. Write an A.P. when the common differnce d and the first term a are given.

a = -3.5, d = -3.5

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10. Write an A.P. when the common differnce d and the first term a are given.

a = 10, d = -3

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11. How many terms are there in the A.P.

187,194,201,...,439?

12. Find n, if the nth term of the following

sequence is 68.

5,8,11,14,.....

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

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15. Find the eighteenth term of the A.P.1,7,13,19.

16. Find t_{11} from the following A.P. 4,9,14,....

17. Determine the $10th$ term from the end of

the A.P. $4, \ 9, \ 14, \ ; \ 254$.

18. For what value of n, the nth term of the following two A.P.s are equal? 23,25,27,29,.....and -17,-10,-3,4,....

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19. The sixth term of an A.P. is 5 times the 1th term and the eleventh term exceeds twice the fifth term by 3. Find the 8th term.

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

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21. Obtain the sum of 56 terms of an A.P. whose 19th and 28th terms are 52 and 148 respectively.

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22. If the 5th and 12th terms of an A.P. are 30 and 65 respectively, what is the sum of first 0 terms?

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

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24. The first and the last terms of an A.P. are 17 and 350 respectively. If the common difference is 9, how many terms are there and what is their sum?

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

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

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

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

29. 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?

30. 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 temperature of Thursday and Friday is 15. Find the temperature of each of the five days.

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31. 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?

32. 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 should be the first and the last installment?

33. 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 his first installment?

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Assigenment 3

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

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

3. Determine whether following sequence is an A.P.

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

4. First term and common difference of an A.P.

are 6 and 3 respectively : Find S_{27}

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

7, 13, 19, 25, ...

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

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7. A village has 4000 literate people in the year 2010 and this number increases by 400 per year. How many literate people will be there till year 2020?

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8. Find four consecutive terms in an A.P. whose sum is 12 and the sum of 3rd and 4th term is 14.

(Let four consecutive terms be a -d ,a,a+d, a+2d)

9. If the sum of p terms of an A.P. is q and the sum of q terms is p, then the sum of $p + q$ terms will be

10. Mr. Ajay Sharma borrows ₹3,25,000. He paid ₹30,500 in the first month and then each instanllment becing less than the preceding installment by ₹1500. How long will it take to clear his loan?

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