



# MATHS

## BOOKS - CBSE COMPLEMENTARY MATERIAL MATHS (HINGLISH)

### ARITHMETIC PROGRESSION

#### Very Short Answer Type Questions

1. Find 5<sup>th</sup> terms of an A.P. whose nth term is  $3n-5$



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2. Find the sum of first 10 even natural numbers.



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3. Write the  $n$ th term of odd numbers.



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4. Find the sum of first  $n$  natural numbers.



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5. Write the sum of first  $n$  even natural numbers.



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6. Find the  $n$ th term of the A.P.

$-10, -15, -20, -25, \dots$



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7. Find the common difference of A.P

$$4\left(\frac{1}{9}\right), 4\left(\frac{2}{9}\right), 4\left(\frac{1}{3}\right) \dots\dots\dots$$



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8. Write the common difference of an A.P.

whose  $n$ th term is  $a_n = 3n + 7$ .



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9. What will be the value of  $a_8 - a_4$  for the following A.P. 4,9,14,....., 254



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10. What is value of  $a_{16}$  for the A.P.  $-10, -12, -14, -16$ .....



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11. 3,  $k - 2$ , 5 are in A.P, find  $k$ .





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**12.** For what value of  $p$ , the following terms are three consecutive terms of an A.P.  $\frac{4}{5}, p, 2$ .



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**13.** In the following A.P.s find the missing terms in the blanks:

(a) 2, \_\_\_\_, 26

(b) \_\_\_\_, 13, \_\_\_\_ 3

(c) 5, \_\_\_\_, \_\_\_\_\_,  $9\left(\frac{1}{2}\right)$

$-4, \underline{\hspace{1cm}}, \underline{\hspace{1cm}}, \underline{\hspace{1cm}}, \underline{\hspace{1cm}}, 6$

( e )  $\underline{\hspace{1cm}}, 38. \underline{\hspace{1cm}}, \underline{\hspace{1cm}}, \underline{\hspace{1cm}}, -22$



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## Multiple Choice Questions

1. 30th term of the A.P.  $10, 7, 4, \dots$  is

A. 97

B. 77

C.  $-77$

D.  $-87$

**Answer: C**



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2. 11th term of an A.P.  $-3, -\frac{1}{2}, \dots$  is

A. 28

B. 22

C.  $-38$

D.  $-48\left(\frac{1}{2}\right)$



**Answer: B**



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**3.** In an AP, if  $d = -4$ ,  $n = 7$  and  $a_n = 4$ , then  $a$  is equal to

A. 6

B. 7

C. 120

D. 28

**Answer: D**



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4. The first three terms of an A.P. respectively are  $3y - 1$ ,  $3y + 5$  and  $5y + 1$ . Then,  $y$  equals  
– 3 (b) 4 (c) 5 (d) 2

A. – 3

B. 4

C. 5

D. 2

**Answer: C**



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5. The list of number -10, -6, -2, 2, ... is

A. An A.P. with  $d = -16$

B. An A.P. with  $d=4$

C. An A.P. with  $d = -4$

D. Not an A.P.

**Answer: B**



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6. Find the 11<sup>th</sup> from the last term (towards the first term) of the AP : 10, 7, 4, ..., 62.

A. 25

B. - 32

C. 16

D. 0

**Answer: B**



7. The famous mathematician associated with finding the sum of the first 100 natural numbers is

A. Pythagoras

B. Newton

C. Gauss

D. Euclid

**Answer: C**



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8. What is the common difference of an AP in which  $a_{18} - a_{14} = 32$ ?

A. 8

B.  $-8$

C.  $-4$

D. 4

**Answer: A**



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## Match The Following

### 1. Match the following Column - A and Column

- B

Column A

- (a)  $a = -18, n = 10, d = 2$  then an of A.P.
- (b)  $a, b$  and  $c$  in A.P. then their Arithmetic mean is
- (c) If 2, 4, 6, are in A.P. then 4, 8, 12 will also be an
- (d) If  $a_n = 9 - 5n$  of an A.P. then  $a_{10}$  will be
- (e) If  $d = -2, n = 5$  and  $a_n = 0$  in A.P. then  $a$  is

Column B

- (a)  $\frac{a+c}{2}$
- (b) 0
- (c) -41
- (d) 8
- (e) A.P.



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State True False And Justify

1. Is 301 a term of A.P. 5,11,17,23..... ?



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2. Difference of  $m$ th and  $n$ th term of an A.P. =  
 $(m-n)d$ .



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3. 2,5,9,14,..... Is an A.P.



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4. Sum of first 20 natural numbers is 410.



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5.  $n$ th term of A.P. 5, 10, 15, 20, .....  $n$  terms and  $n$ th term of A.P. 15, 30, 45, 60, .....  $n$  terms are same.



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1. Is 144 a term of the A.P. 3,7,11,.....? Justify your answer.



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2. What is 20th term from the end of the AP 3, 8, 13, ..., 253?



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3. Which term of the arithmetic progression 5, 15, 25, . . . will be 130 more than its 31<sup>st</sup> term?



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4. The first term, common difference and last term of an A.P. are 12, 6 and 252 respectively, Find the sum of all terms of this A.P.



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5. Find the sum of the first 15 multiples of 8



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6. In which of the following situations, the sequence formed will form an A.P.? (i) Number of students left in the school auditorium from the total strength of 1000 students when they leave the auditorium in batches of 25. (ii) The amount of money in the account every year when 100 are deposited annually to

accumulate at compound interest at 4% per annum



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7. Find the sum of even positive integers between 1 and 200.



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8. If  $4m + 8$ ,  $2m^2 + 3m + 6$ ,  $3m^2 + 4m + 4$  are three consecutive terms of an A.P. Find  $m$ .



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9. How many terms of the A.P. 22,20,18.....should be taken so that their sum is zero.



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10. If 10 times of 10th term is equal to 20 times of 20th term of an A.P. Find its 30th term.



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**11.** Find the middle term of the A.P.  
6, 13, 20, 216.



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**12.** Is  $-150$  a term of the A.P. 11, 8, 5, 2, ?



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13. Find how many two-digit numbers are divisible by 6.



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14. If  $\frac{1}{x+2}$ ,  $\frac{1}{x+3}$  and  $\frac{1}{x+5}$  are in A.P. find

x



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**15.** Find the middle term of an A.P.  $-6, -2, 2,$   
.....58.



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**16.** In an A.P. find  $S_n$  where  $a_n = 5n - 1$ . Hence  
find the sum of the first 20 terms.



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**17.** Which term of A.P. 3,7,11,15,..... Is 79? Also find the sum  $3+7+11+\dots+79$



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**18.** Which term of the A.P. 121, 117, 113,..... Is the first negative terms ?



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19. Find the  $20^{\text{th}}$  term from the last term of the AP : 3, 8, 13, ..., 253.



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## Short Answer Type Questions li

1. Find the middle term(s) of the A.P.  
7, 13, 19, ; 241 .



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2. Find the sum of integers between 10 and 500 which are divisible by 7



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3. The sum of 5th and 9th term of an A.P. is 72 and the sum of 7th and 12th terms is 97 . Find that



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4. If the  $m$ th term of an A.P. be  $1/n$  and  $n$ th term be  $1/m$  then show that its  $(mn)$  term is 1.



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5. If the  $p^{\text{th}}$  term of an A.P. is  $q$  and the  $q^{\text{th}}$  term is  $p$ , prove that its  $n^{\text{th}}$  term is  $(p + q - n)$ .



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6. Find the number of natural numbers between 101 and 999 which are divisible by both 2 and 5.



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7. The sum of 5th and 9th terms of an A.P. is 30. If its 25th term is three times its 8th term, find the A.P.



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8. If  $s_n$ , the sum of first  $n$  terms of an A.P., is given by  $S_n = 5n^2 + 3n$ , then find its  $n^{\text{th}}$  term.



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9. Which term of the AP 3, 15, 27, 39,... will be 120 more than its 21st term?



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10. If  $S_n$  the sum of first  $n$  terms of an A.P. is given by  $S_n = 3n^2 - 4n$ , find the  $n$ th term.



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11. In a flower bed, there are 23 rose plants in the first row, 21 in the second, 19 in the third, and so on. There are 5 rose plants in the last row. How many rows are there in the flower bed?



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**12.** For what value of  $n$ , are the with terms of two APs:  $63, 65, 67, \dots$  and  $3, 10, 17, \dots$  equal?



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**13.** Which term of the A.P.  $3, 15, 27, 39, \dots$  will be 132 more than its  $54^{th}$  term?



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**14.** If the sum of the first 14 terms of an AP is 1050 and its first term is 10, find the  $20^{th}$  term.



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**15.** Find the sum of the odd numbers between 0 and 50.



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**16.** If  $S_n = 4n^2 - n^2$  in an A.P. find the A.P.



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



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## Long Answer Type Questions

1. The sum of the third and the seventh terms of an AP is 6 and their product is 8. Find the

sum of first sixteen terms of the AP.



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2. Determine the A.P. whose 4th term is 18 and the difference of 9th term from the 15th term is 30.



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3. The sum of first  $q$  terms of an A.P. is 162. The ratio of its 6th term to its 13th term is  $1:2$ .

Find the first and 15<sup>th</sup> term of the A.P.



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4. If the 10<sup>th</sup> term of an A.P. is 21 and the sum of its first ten terms is 120, find its  $n$ <sup>th</sup> term.



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5. The sum of first 20 terms of an A.P. is one third of the sum of next 20 term. If first term is 1, find the sum of first 30 terms of this A.P.



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6. The sum of first 20 terms of an A.P. is one third of the sum of next 20 term. If first term is 1, find the sum of first 30 terms of this A.P.



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7. If the sum of the first four terms of an AP is 40 and the sum of the first fourteen terms of

an AP is 280. Find the sum of first  $n$  terms of the A.P.



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**8.** Ramkali required Rs 2500 after 12 weeks to send her daughter to school. She saved Rs100 in first week and increased her weekly savings by Rs 20 every week. Find whether she will be able to send her daughter to school after 12 weeks. What value is generated in the above situation?



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**9.** In a AP of 50 terms the sum of first 10 terms is 210 and the sum of last 15 terms is 2565. Then find the AP



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**10.** The sum of first  $n$  terms of an A.P. is  $5n^2 + 3n$ . If the  $n$ th term is 168, find the value of  $n$ . Also find the 20th term of the A.P.



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**11.** If the sum of first 7 terms of an A.P. is 49 and that of its 17 terms is 289, find the sum of first  $n$  terms of the A.P.



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**12.** If the 4th term of an A.P. is zero, prove that the 25th term of the A.P. is three times its 11th term.



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**13.** In an AP, it is given that  $S_5 + S_7 = 167$  and  $S_{10} = 235$ , then find the AP, where  $S_n$  denotes the sum of its first  $n$  terms.



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**14.** If  $S_n$  denotes the sum of first  $n$  terms of an A.P., prove that  $S_{12} = 3(S_8 - S_4)$ .



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## Practice Test Section A

1. The sum of first 10 natural numbers.



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2. What is the common difference of an A.P.

$$8\frac{1}{8}, 8\frac{2}{8}, 8\frac{3}{8}, \dots$$



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3. If  $k$ ,  $2k-1$  and  $2k+1$  are in A.P. then value of  $k$  is

.....



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4. Find the 10th term from the end of the A.P.

8,10,12, ... 126.



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**Practice Test Section B**

1. How many 2 digit number are ther in between 6 and 102 which are divisible by 6.



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2. The sum of n terms of an A.P. is  $n^2 + 3n$ .  
Find its 20th term.



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3. Find the sum :

$$(-5) + (-8) + (-11) + \dots + (-230)$$



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## Practice Test Section C

1. Find the five terms of an A.P. whose sum is

$12\left(\frac{1}{2}\right)$  and first and last term ratio is 2:3.



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2. Find the middle term of an A.P. 20,16,12,.....  
– 176.



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## Practice Test Section D

1. If the sum of three numbers in A.P., is 24 and their product is 440, find the numbers.



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