



# MATHS

## BOOKS - NAND LAL PUBLICATION

### ARITHMETIC PROGRESSIONS

#### Exercise 5 1

1. Write first four terms of the AP, when the first term  $a$  and the common difference  $d$  are given as follows :-  $a=10, d=10$  .



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2. Write first four terms of A.P. when first term  $a = -2$  and common difference  $d = 0$ .



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3. Write first four terms of A.P. when first term  $a = 3$  and common difference  $d = 2$ .



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4. Write first four terms of the AP, when the first term  $a$  and common difference  $d$  are given as

$$a = -1, d = \frac{1}{2}$$



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5. Write first four terms of the AP, when the first term  $a$  and the common difference  $d$  are given as follows :-  $a=-1.25$  ,  $d=-0.25$  .



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6. For the following A.P.s, write the first term and the common difference :-  $3, 1, -1, -3, \dots$  .



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7. For the following A.P.s, write the first term and the common difference :-  $-5, -1, 3, 7, \dots$  .



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8. For the following A.P.s, write the first term and the common difference :-

$$\frac{1}{3}, \frac{5}{3}, \frac{9}{3}, \frac{13}{3}, \dots$$



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9. For the following A.P.s, write the first term and the common difference :- 0.6, 1.7, 2.8, 3.9... .



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**10.** Which of the following are APs ? If they form an AP, find the common difference  $d$  and write three more terms. :- 2,4,8,16 .



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**11.** Which of the following are APs ? If they form an AP, find the common difference  $d$  and write three more terms. :-  $2, 5/2, 3, 7/2, \dots$  .



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**12.** Which of the following are APs ? If they form an AP, find the common difference  $d$  and write three more terms. :-  $-1.2, -3.2, -5.2, -7.2, \dots$  .



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**13.** Which of the following are APs ? If they form an AP, find the common difference  $d$  and write three more terms. :-  $-10, -6, -2, 2, \dots$



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14. Which of the following are APs ? If they form an AP, find the common difference  $d$  and write three more terms. :-

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



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15. Which of the following are APs ? If they form an AP, find the common difference  $d$  and write three more terms. :- 0.2, 0.22, 0.222, 0.2222, ...



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16. Which of the following are APs ? If they form an AP, find the common difference  $d$  and write three more terms. :- 0, -4, -8, -12, ...



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17. Which of the following are APs ? If they form an AP, find the common difference  $d$  and write three more terms. :-

$$-\frac{1}{2}, -\frac{1}{2}, -\frac{1}{2}, -\frac{1}{2}, \dots$$



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**18.** Which of the following are APs ? If they form an AP, find the common difference  $d$  and write three more terms. :- 1,3,9,27, ...



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**19.** Which of the following are APs ? If they form an AP, find the common difference  $d$  and write three more terms. :-  $a, 2a, 3a, 4a, \dots$



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20. Which of the following are APs ? If they form an AP, find the common difference  $d$  and write three more terms. :-  $a, a^2, a^3, a^4, \dots$



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21. Which of the following are APs ? If they form an AP, find the common difference  $d$  and write three more terms. :-  $\sqrt{2}, \sqrt{8}, \sqrt{18}, \sqrt{32}, \dots$





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22. Which of the following are APs ? If they form an AP, find the common difference  $d$  and write three more terms. :-  $\sqrt{3}, \sqrt{6}, \sqrt{9}, \sqrt{12}, \dots$



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23. Which of the following are APs ? If they form an AP, find the common difference  $d$  and write three more terms. :-  $1^2, 3^2, 5^2, 7^2, \dots$



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24. Which of the following are APs ? If they form an AP, find the common difference  $d$  and write three more terms. :-  $1^2, 5^2, 7^2, 73, \dots$



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## Exercise 5 2

1. Fill in the blanks in the following table, given that  $a$  is the first term,  $d$  the common

difference and  $a_n$  the  $n$ th term of the AP:

$a$	$d$	$n$	$a_n$
7	3	8	...
-18	...	10	0
...	-3	18	-5
-18.9	2.5	...	3.6
3.5	0	105	...



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2. Choose the correct choice in the

30th term of the 10, 7, 4, ..., is

A. 77

B.  $-77$

C.  $-87$

D.  $-67$

**Answer: C**



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**3.** Choose the correct choice in the following and justify :- 11th term of the AP :  $-3, -\frac{1}{2}, 2, \dots$  is

A. 22

B.  $-38$

C.  $-48\frac{1}{2}$

D. 32

**Answer: B**



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**4.** In the following APs, find the missing terms in the boxes :- 2,  $\square$ , 26 .





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5. In the following APs, find the missing terms in the boxes :-  $\square$ , 13,  $\square$ , 3.



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6. In the following APs, find the missing terms in the boxes :- 5,  $\square$ ,  $\square$ ,  $9\frac{1}{2}$ .



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7. In the following APs, find the missing terms in the boxes :-  $-4, \square, \square, \square, \square 6$ .



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8. In the following APs, find the missing terms in the boxes :-  $\square, 38, \square, \square, \square, -22$ .



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9. Which term of the A.P.  $3, 8, 13, 18, \dots$  is 78?



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**10.** Find the number of terms in each of the following APs :- 7, 13, 19,..., 205 .



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**11.** Is  $-150$  a term of AP 11, 8, 5, 2,...? Why?



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**12.** Find the 31st term of an AP whose  $11^{th}$  term is 38 and  $16^{th}$  term is 73.



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**13.** An AP consists of 50 terms of which 3rd term is 12 and the last term is 106. Find the  $29^{th}$  term.



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**14.** If the 3rd and  $9^{th}$  terms of an A.P. are 4 and -8 respectively, which term of this A.P. is zero.



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**15.** The 17th term of an AP exceeds its 10th term by 7. Find the common difference,



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



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**17.** Two APs have the same common difference. The difference between their  $100^{th}$  terms is 100, what is the difference between their  $1000^{th}$  terms ?



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**18.** How many three-digits numbers are divisible by 7 ?



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**19.** How many multiples of 4 lie between 10 and 50 ?



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**20.** For what value of  $n$ , are the  $n^{\text{th}}$  terms of two A.P.s 63, 65, 67... and 3, 10, 17... equal?



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**21.** Determine the AP whose third term is 10 and the 7th term exceeds the 5th term by 12.



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



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23. The sum of the  $4^{\text{th}}$  and  $8^{\text{th}}$  term of an AP is 24 and the sum of the  $6^{\text{th}}$  and  $10^{\text{th}}$  terms is 44. Find the first three terms of the A.P



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24. Subba Rao started work in 1995 at an annual salary of \$5000 and received an increment of \$ 200 each year. In which year did his income reach \$ 7000 ?



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25. Ramkali saved \$ 5 in the first week of a year and then increased her weekly saving by \$1.75. If in the  $n^{th}$  week, her weekly saving becomes \$20.75, find  $n$ .





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### Exercise 5 3

1. Find the sum of the following APs :- 2, 7, 12, ...  
to 10 terms.



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2. Find the sum of the following APs :- - 37, - 33,  
- 29,... to 12 terms



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3. Find the sum of the following APs :- 0.6, 1.7, 2.8, ... to 100 terms.



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4. Find the sum of the following APs :-

$\frac{1}{15}, \frac{1}{12}, \frac{1}{10}, \dots$  To 11 terms .



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5. Find the sums given below :-  $7+10\frac{1}{2}$   
 $+14+\dots+84$  .



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6. Find the sums given below :-  $34 + 32 + 30 +$   
 $\dots + 10$  .



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7. Find the sums given below :-  $- 5 + (- 8) + (- 11)$   
 $+ \dots + (- 230)$ .



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8. In an AP :- given  $a = 5$ ,  $d = 3$ ,  $a_n = 50$  find  $n$   
and  $S_n$ .



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9. In an AP :- given  $a = 7$ ,  $a_{13} = 35$  find  $d$  and  $S_{13}$ .



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10. In an AP :- given  $a_{12} = 37$ ,  $d = 3$ , find  $a$  and  $S_{12}$ .



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11. In an AP :- given  $a_3 = 15$ ,  $d$ ,  $S_{10}=125$  find  $d$  and  $a_{10}$ .



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12. In an AP :- given  $d = 5$ ,  $S_9=75$ , find  $a$  and  $a_9$ .



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13. In an AP :- given  $a = 2$ ,  $d = 8$ ,  $S_n = 90$  find  $n$  and  $a_n$ .



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14. In an AP :- given  $a = 8$ ,  $a_n = 62$ .  $S_n=210$ , find  $n$  and  $d$ .







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**15.** In an AP :- given  $a_n = 4$ ,  $d=2$ ,  $S_n=-14$ , find  $n$  and  $a$  .



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**16.** In an AP :- given  $a = 3$ ,  $n = 8$ ,  $S = 192$ , find  $d$ .



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**17.** In an AP :- given  $l = 28$ ,  $S = 144$ , and there are total 9 terms. Find  $a$ .



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



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**19.** Find the sum of first 22 terms of an AP in which  $d=7$  and 22nd term is 149.



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**20.** If the sum of first 7 terms of an AP is 49 and that of 17, terms is 289, find the sum of first  $n$  terms.



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21. Show that  $a_1, a_2, \dots, a_n, \dots$  form an AP

where  $a_n$  is defined as below,  $a_n = 3 + 4n$

Also find the sum of the first 15 terms in each

case.



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22. Show that  $a_1, a_2, \dots, a_n, \dots$  form an AP

where  $a_n$  is defined as below,  $a_n = 9 - 5n$

Also find the sum of the first 15 terms in each

case.





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**23.** Find the sum of the first 40 positive integers divisible by 6.



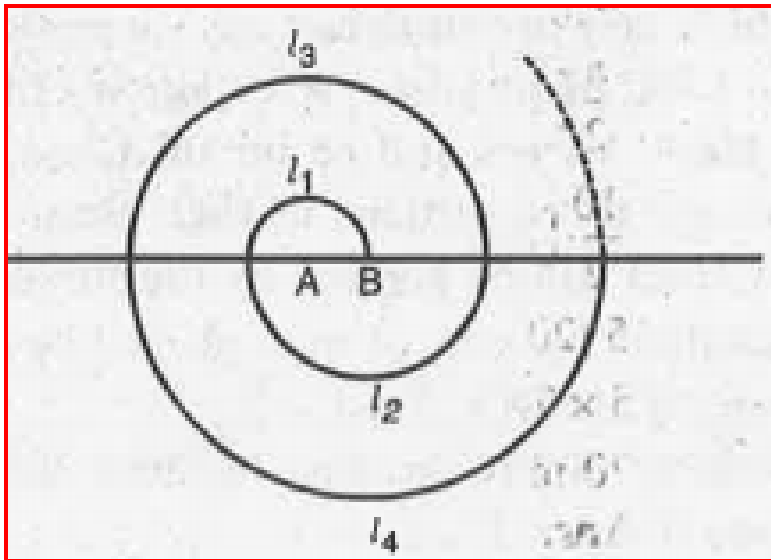
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**24.** Find the sum of first 15 multiples of 8.



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25. A spiral is made up of successive semicircles, with centres alternately at A and B, starting with centre at A, of radii 0.5 cm, 1.0 cm, 1.5 cm, 2.0 cm, .... as shown in Fig. What is the total length of such a spiral made up of thirteen consecutive semicircles ?



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## Exercise 5 4

1. Which term of the A.P. 121, 117, 113, ... is its first negative term ?



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2. The sum of the third and the seventh term of an A.P. is 6 and their product is 8. Find the sum of first sixteen terms of an A.P.



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