



MATHS

NCERT - NCERT MATHEMATICS(TELUGU)

SEQUENCES AND SERIES

Example

1. Write the first three terms in each of the following sequences defined by the following:

(i)
$$a_n=2n+5,$$
 (ii) $a_n=rac{n-3}{4}$

2. What is the $20^{
m th}$ term of the sequence defined by

$$a_n = (n-1)(2-n)(3+n)?$$



3. Let the sequence a_n be defined as follows:

$$a_1=1, a_n=a_{n-1}+2$$
 for $n\geq 2$.

Find first five terms and write corresponding series

Watch Video Solution

4. If the sum of n terms of an A.P. is $nP + \frac{1}{2}n(n-1)Q$, where P and Q are constants, find the common





6. The income of a person is Rs. 3,00,000, in the first year and he receives an increase of Rs.10,000 to his income per year for the next 19 years. Find the total amount, he received in 20 years.



9. Which term of the G.P., 2,8,32, ... up to n terms is

131072 ?





terms of the geometric series $1+rac{2}{3}+rac{4}{9}+....$





13. The sum of first three terms of a G.P. is $rac{13}{12}$ and their

product is - 1. Find the common ratio and the terms.



14. Find the sum of the sequence 7, 77, 777, 7777, ... to n

terms.



15. A person has 2 parents, 4 grandparents, 8 great grandparents, and so on.Find the number of his ancestors during the ten generations preceding his own.

Watch Video Solution

16. Insert three numbers between 1 and 256 so that the

resulting sequence is a G.P.



17. If A.M. and G.M. of two positive numbers a and b are

10 and 8, respectively, find the numbers.



19. Find the sum to n terms of the series whose n^{th} term is n (n+3).



1. If p^{th}, q^{th}, r^{th} and s^{th} terms of an A.P. are in G.P, then

show that (p - q), (q - r), (r - s) are also in G.P.

Watch Video Solution

2. If a, b, c are in G.P. and $a^{rac{1}{x}}=b^{rac{1}{y}}=c^{rac{1}{z}}$, prove that x, y

, z are in A.P

3. If a, b, c, d and p are different real numbers such that $ig(a^2+b^2+c^2ig)p^2\!\!-2(ab+bc+cd)p+ig(b^2+c^2+d^2ig)\leq 0$

, then show that a, b, c and d are in GP.

Watch Video Solution

4. If a, b, c are in G.P then prove that equations $ax^2 + 2bx + c = 0$ and $dx^2 + 2ex + f = 0$ have a common root if $\frac{d}{a}$, $\frac{e}{b}$, $\frac{f}{c}$ are in A.P.



1. Write the first five terms of each of the sequences

whose n^{th} terms are:

$$a_n = n(n+2)$$

Watch Video Solution

2. Write the first five terms of each of the sequences whose n^{th} terms are:

$$a_n = rac{n}{n+1}$$



3. Write the first five terms of each of the sequences

whose n^{th} terms are:

$$a_n = 2^n$$
Watch Video Solution
4. Write the first five terms of each of the sequences
whose n^{th} terms are:
$$a_n = \frac{2n-3}{6}$$
Watch Video Solution

5. Write the first five terms of each of the sequences whose n^{th} terms are:

$$a_n = (\,-1)^{n\,-\,1} 5^{n\,+\,1}$$

6. Write the first five terms of each of the sequences whose n^{th} terms are:

$$a_n=nrac{n^2+5}{4}$$



Watch Video Solution

7. Find the indicated terms in each of the sequences whose $n^{\rm th}$ terms are:

 $a_n=4n-3,a_{17},a_{24}$

8. Find the indicated terms in each of the sequences

whose $n^{ ext{th}}$ terms are:

$$a_n=rac{n^2}{2^n},a_7$$

Watch Video Solution

9. Find the indicated terms in each of the sequences whose n^{th} terms are:

$$a_n = {(\,-1)}^{n-1} n^3, a_9$$

10. Find the indicated terms in each of the sequences

whose $n^{ ext{th}}$ terms are:

$$a_n=rac{n(n-2)}{n+3},a_{20}$$

Watch Video Solution

11. Write the first five terms of each of the sequences and obtain the corresponding series:

$$a_1=3, a_n=3a_{n-1}+2$$
 for all $n>1$

12. Write the first five terms of each of the sequences

and obtain the corresponding series:

$$a_1 = -1, a_n = rac{a_{n-1}}{n}, n \geq 2$$

Watch Video Solution

13. Write the first five terms of each of the sequences and obtain the corresponding series:

$$a_1=a_2=2, a_n=a_{n-1}-1, n>2$$

14. The Fibonacci sequence is defined by

$$1 = a_1 = a_2$$
 and $a_n = a_{n-1} + a_{n-2}, n > 2$ Find
 $\frac{a_{n+1}}{a_n}$ for n = 1, 2, 3, 4, 5
Watch Video Solution

Exercise 9 2

1. Find the sum of odd integers from 1 to 2001.



2. Find the sum of all natural numbers lying between

100 and 1000, which are multiples of 5.



3. In an A.P., the first term is 2 and the sum of the first five terms is one-fourth of the next five terms. Show that 20^{th} term is –112.

Watch Video Solution

4. How many terms of A.P. -6, $\frac{-11}{2}$, -5 are needed to obtain a sum -25?

5. In an A.P. if p^{th} term is $\frac{1}{q}$ and q^{th} term is $\frac{1}{p}$, prove that the sum of first pq terms is $\frac{1}{2}(pq+1)$, where $p \neq q$.

Watch Video Solution

6. If the sum of a certain number of terms of the A.P. 25,

22, 19, ... is 116. Find the last term.



7. Find the sum to n terms of the A.P., whose $k^{
m th}$ term is

5k + 1.



 18^{th} terms.



10. If the sum of first p terms of an A.P. is equal to the sum of the first q terms, then find the sum of the first (p + q) terms.

Watch Video Solution

11. The ratio of the sums of m and n terms of an A.P. is $m^2: n^2$. Show that the ratio of m^{th} and n^{th} term is (2m-1): (2n-1).

12. If the sum of n terms of an A.P. is $3n^2 + 5n$ and its

 $m^{
m th}$ term is 164, find the value of m .

Watch Video Solution
13. Insert five numbers between 8 and 26 such that the
resulting sequence is an A.P.
View Text Solution
14. If
$$\frac{a^{n+1} + b^{n+1}}{a^n + b^n}$$
 is the AM of a and b then n =

15. Between 1 and 31, m numbers have been inserted in such a way that the resulting sequence is an A. P. and the ratio of 7^{th} and $(m-1)^{th}$ numbers is 5 : 9. Find the value of m.

Watch Video Solution

16. A man starts repaying a loan as first instalment of Rs. 100. If he increases the instalment by Rs 5 every month, what amount he will pay in the 30^{th} instalment?



17. The difference between any two consecutive interior

angles of a polygon is 5° .If the smallest angle is 120° ,

find the number of the sides of the polygon.

View Text Solution
Exercise 9 3
1. Find the 20^{th} and n^{th} term of the G.P. $\frac{5}{2}, \frac{5}{4}, \frac{5}{8}, \dots$
Vatch Video Solution

2. Find the 12^{th} term of a G.P. whose 8^{th} term is 192 and

the common ratio is 2.



4. The 4^{th} term of a G.P. is square of its second term,

and the first term is – 3.Determine its 7^{th} term.



6. For what values of x, the numbers
$$-\frac{2}{7}, x, -\frac{7}{2}$$
 are

in G.P?



7. Find the sum to indicated number of terms in each of

the geometric progressions in

0.15, 0.015, 0.0015 ,......20 terms .

Watch Video Solution

8. Find the sum to indicated number of terms in each of

the geometric progressions in

 $\sqrt{7},\sqrt{21}3\sqrt{7}$,n terms

9. Find the sum to indicated number of terms in each of

the geometric progressions in Exercises

$$1,\ -a,a^2,\ -a^3,\,...n$$
 terms (if $a
eq-1$)

Watch Video Solution

10. Find the sum to indicated number of terms in each

of the geometric progressions in

$$x^3, x^5, x^7,n$$
 terms (if $x
eq \pm 1$)

11. Evaluate
$$\sum_{k=1}^{11} \left(2+3^k
ight)$$



12. The sum of first three terms of a G.P. is 39/10 and their product is 1. Find the common ratio and the terms.

Watch Video Solution

13. How many terms of a G.P.3, 3², 3³, Are needed to

give the sum 120?

14. The sum of first three terms of a G.P. is 16 and the sum of the next three terms is 128. Determine the first term, the common ratio and the sum to n terms of the G.P.



15. Given a G.P. with a = 729 and $7^{\rm th}$ term 64, determine

 S_7 .



16. Find a G.P. for which sum of the first two terms is - 4

and the fifth term is 4 times the third term.



17. If the 4th, 10th and 16th terms of a G.P. are x, y and z,

respectively. Prove that x, y, z are in GP.



18. Find the sum to n terms of the sequence, 8, 88, 888,

8888... .



19. Find the sum of the products of the corresponding terms of the sequences 2, 4, 8, 16, 32 and 128, 32, 8, 2 $\underline{1}$





20. Show that the products of the corresponding terms of the sequences a, ar, $ar^2, \ldots ar^{n-1}$ and A, AR, $AR^2, \ldots AR^{n-1}$ form a G.P, and find the common ratio.



21. Find four numbers forming a geometric progression in which the third term is greater than the first term by 9, and the second term is greater than the $4^{\rm th}$ by 18.



22. If the $p^{
m th}, q^{
m th}\,\,{
m and}\,\,r^{
m th}$ terms of a G.P. are a, b and c,

respectively. Prove that $a^{q-r}b^{r-p}c^{P-q}$ = 1.

Watch Video Solution

23. If a, b, c and d are in G.P. show that $\left(a^2+b^2+c^2
ight)\left(b^2+c^2+d^2
ight)=\left(ab+bc+cd
ight)^2$





Watch Video Solution

26. The number of bacteria in a certain culture doubles every hour. If there were 30 bacteria present in the

culture originally, how many bacteria will be present at

the end of $2^{
m nd}$ hour, $4^{
m th}$ hour and $n^{
m th}$ hour ?



27. What will Rs 500 amounts to in 10 years after its deposit in a bank which pays annual interest rate of 10% compounded annually?



28. If A.M. and G.M. of roots of a quadratic equation are

8 and 5, respectively, then obtain the quadratic equation.





5. Find the sum to n terms of each of the series in

$$5^2 + 6^2 + 7^2 + \ldots + 20^2$$

View Text Solution



8. Find the sum to n terms of the series in whose n^{th} terms is given by

n(n+1)(n+4)





10. Find the sum to n terms of the series in whose n^{th}

terms is given by

$$\left(2n-1
ight)^2$$

View Text Solution

1. Show that the sum of $(m+n)^{th}$ and $(m\!-\!n)^{th}$

terms of an A.P. is equal to twice the m^{th} term.

Watch Video Solution

2. If the sum of three numbers in A.P., is 24 and their

product is 440, find the numbers.



3. Find the sum of all numbers between 200 and 400

which are divisible by 7.



> Watch Video Solution

5. Find the sum of all two digit numbers which when

divided by 4, yields 1 as remainder.



6. If f is a function satisfying f (x +y) = f(x) f(y) for all $x,y\in N$ such that f(1)=3 and $\sum_{x=1}^n f(x)=120$,

find the value of n.

Watch Video Solution

7. The sum of some terms of G.P. is 315 whose first term and the common ratio are 5 and 2, respectively. Find the last term and the number of terms.



8. The first term of a G.P. is 1. The sum of the third term

and fifth term is 90. Find the common ratio of G.P.



9. The sum of three numbers in G.P. is 56. If we subtract

1, 7, 21 from these numbers in that order, we obtain an

arithmetic progression. Find the numbers.

Watch Video Solution

10. A G.P. consists of an even number of terms. If the sum of all the terms is 5 times the sum of terms

occupying odd places, then find its common ratio.



11. The sum of the first four terms of an A.P. is 56. The sum of the last four terms is 112. If its first term is 11, then find the number of terms.

View Text Solution

12. If
$$\displaystyle rac{a+bx}{a-bx}=\displaystyle rac{b+cx}{b-cx}=\displaystyle rac{c+dx}{c-dx}(x
eq 0),\,$$
 then a ,b ,c ,d are in

13. Find the 5th term of the sequence $1,\sqrt{2}, 2$

Watch Video Solution
14. Find the 6th term from the end of the A.P:17,14,11,40
Watch Video Solution
15. If a $igg(rac{1}{b}+rac{1}{c}igg), bigg(rac{1}{c}+rac{1}{a}igg), cigg(rac{1}{a}+rac{1}{b}igg)$ are in A.P.,

then



Watch Video Solution

17. Find the product of the following pairs?

$$-10ab^3, -6a^2b$$

Watch Video Solution

18. Find the product of the following pairs?

$$6pq, -2pq^2$$

19. Find the product of the following pairs?

2lm, 5m





23. If $S_1, S_2, S_3,\,$ are the sums of first n natural numbers their squares and their cubes respectively, then $S_3(1+8S_1)=$







26. A farmer buys a used tractor for Rs 12000. He pays Rs 6000 cash and agrees to pay the balance in annual instalments of Rs 500 plus 12% interest on the unpaid amount. How much will the tractor cost him?



View Text Solution

27. Shamshad Ali buys a scooter for Rs 22000. He pays Rs 4000 cash and agrees to pay the balance in annual instalment of Rs 1000 plus 10% interest on the unpaid amount. How much will the scooter cost him?

View Text Solution

28. Find the product of the following pairs?

$$12p^3qr^2,\ -2pq^2$$



29. Find the product of the following pairs?

 $15q^2r, 2p^2q$



30. A manufacturer reckons that the value of a machine,

which costs him Rs. 15625, will depreciate each year by

20%. Find the estimated value at the end of 5 years.

31. 150 workers were engaged to finish a job in a certain

number of days. 4 workers dropped out on second day,

4 more workers dropped out on third day and so on.

