



MATHS

BOOKS - MAHAVEER PUBLICATION

SERIES

Question Bank

1. 3,6,9,12,.....

Each term in a sequence can be referred to by its place in the sequence, i.e. first term, third term, n^{th} term.





Watch Video Solution

2. 2,8,18,32,.....

Each term in a sequence can be referred to by its place in the sequence, i.e. first term, third term, n^{th} term.



Watch Video Solution

3. Find the general (n^{th}) term for the arithmetic sequence : 2,6,10, 14, 18,22,.....



Watch Video Solution

4. Find the general (n^{th}) term for the arithmetic sequence : -5,-3,-1,1,3,.....



[Watch Video Solution](#)

5. Find the general (n^{th}) term for the arithmetic sequence : 1,4,7,10,13,16,.....



[Watch Video Solution](#)

6. Find the number of term in the series 8,12,16,.....,72.



[Watch Video Solution](#)

7. Find a_n if $-1, 10, 21, 32, 43, 54, \dots$



[Watch Video Solution](#)

8. Find a_n if $3, 0, -3, -6, -9, -12, \dots$



[Watch Video Solution](#)

9. Find the following sums $3+7+11+15+\dots+35$



[Watch Video Solution](#)

10. Find the following sums $-2+1+4+7+\dots+25$



[Watch Video Solution](#)

11. In an arithmetic sequence $a_1 + a_3 = 12$ and $a_4 + a_6 = 24$. Find the values of a and d



[Watch Video Solution](#)

12. In an arithmetic series, the sum of the first $2n$ terms is half the sum of the first $3n$ terms. If $a = 12$ and $d = 3$, find the value of n .



[Watch Video Solution](#)

13. Suppose that you play black jack Harrah's on June 1 and \$1000 lose. Tomorrow you bet and lose \$ 15 less. Each day you lose \$ 15 less that your previous loss. What will your total losses be for the 30 days of June ?



Watch Video Solution

14. Insert 5 arithmetic mean between 13 and -11.



Watch Video Solution

15. Find the general (n^{th}) term for the following geometric sequences : 2,6,18,54,.....

 [Watch Video Solution](#)

16. Find the general (n^{th}) term for the following geometric sequences : 27,9,3,1,.....

 [Watch Video Solution](#)

17. Find the general (n^{th}) term for the following geometric sequences : 16,-8,4,-2,1,.....

 [Watch Video Solution](#)

18. Find the 10th term in the series 2,4,8,16,.....



[Watch Video Solution](#)

19. Find the following sums

First 5 terms of $-6+18-54+\dots$



[Watch Video Solution](#)

20. Find the following sums

$5+10+20+40+\dots+2560$



[Watch Video Solution](#)

 Watch Video Solution

21. Find the following sums

$$-2+4-8+16-.....$$



Watch Video Solution

22. Find the following sums

$$24+12+6+3+\frac{3}{2} + \frac{3}{4} + \dots$$



Watch Video Solution

23. Find the sum of the first 8 terms of the series
2,6,18,54.



Watch Video Solution

24. How much is going to taxes? Suppose that we track a tax refund of \$ 100. Each time money is spend 8% goes toward taxes and the rest get spend again. How much of the original \$100 will go back to taxes ?



View Text Solution

25. Insert two geometric means between 2 and 1024.



[Watch Video Solution](#)

26. If A.M. and GM. of two positive numbers a and b are 10 and 8, respectively find the numbers.



[Watch Video Solution](#)

27. The 12^{th} term and 15^{th} term of an AP are 68 and 86 respectively. Find the AP.



[Watch Video Solution](#)

28. Find the sum: $3+7+11+\dots+79$.



[Watch Video Solution](#)

29. Find k if $2k+1, k, 3k+2$ are in GP.



[Watch Video Solution](#)

30. Find 8^{th} term of the GP $1, 4, 16, \dots$



[Watch Video Solution](#)

31. If x, y, z are in GP, then prove that $\log x, \log y, \log z$ are in AP.



[Watch Video Solution](#)

 Watch Video Solution

32. If 3^{rd} term of an arithmetic progression is and term is 18 and 17^{th} term is 30, find the progression.

 Watch Video Solution

33. The sum of the series $3 + 33 + 333 + \dots + n$ terms is

 Watch Video Solution

34. Find the three terms in GP whose sum is 21 and product 64.



Watch Video Solution

35. If a, b, c are in A.P. and x, y, z are in G.P., then prove that :

$$x^{b-c} \cdot y^{c-a} \cdot z^{a-b} = 1$$



Watch Video Solution

36. If a, b, c are the p^{th}, q^{th} and r^{th} terms of an AP then prove that $\sum a(q - r) = 0$



Watch Video Solution

37. Show that, $\log_e 2 = \frac{1}{1.2} + \frac{1}{3.4} + \frac{1}{5.6} + \dots \dots \infty$



Watch Video Solution

38. Show that, $e^x + e^{-x} = 2 \left(1 + \frac{x^2}{2!} + \frac{x^4}{4!} + \dots \right)$



Watch Video Solution

39.

if,

$$y = x - \frac{x^2}{2} + \frac{x^3}{3} - \frac{x^4}{4} + \dots \dots \infty \text{ and } (|x| < 1)$$

then $x = y + \frac{y^2}{a!} + \frac{y^3}{b!} + \dots + \infty$ Find $a^2 + b$



[Watch Video Solution](#)

40.

Prove

that,

$$\frac{1}{1.2} - \frac{1}{2.3} + \frac{1}{3.4} - \dots = 2 \log_e 2 - 1$$



[Watch Video Solution](#)

41. Show that, $1 + \frac{1}{2!} + \frac{1}{4!} + \dots = \frac{1}{2} \left(e + \frac{1}{e} \right)$



[Watch Video Solution](#)

42.

Prove

that,

$$\frac{1}{2.3} - \frac{1}{4.5} + \frac{1}{6.7} + \dots = 1 - \log_e 2$$



Watch Video Solution

43.

Prove

that,

$$1 + \frac{1+2}{2!} + \frac{1+2+3}{3!} + \frac{1+2+3+4}{4!} + \dots = \frac{3e}{2}$$



Watch Video Solution

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



Watch Video Solution

45. Find 11th term in 09,17,25,33,.....



Watch Video Solution

46. How many terms of the A.P. $-6, -\frac{11}{2}, -5, \dots$ are needed to give the sum -25?



Watch Video Solution

47. How many terms of the series : $93+90+87+84+\dots$ Will amount to 975 ?



Watch Video Solution

48. Find four arithmetic mean between 3 and 23 ?



[Watch Video Solution](#)

49. Insert two arithmetic mean between 16 and 22.



[Watch Video Solution](#)

50. Insert three arithmetic mean (AM) between 1 and $\frac{1}{16}$.



[Watch Video Solution](#)

51. Insert four arithmetic mean (AM) between 4 and 19.



[Watch Video Solution](#)

52. Insert three arithmetic mean (AM) between 6 and 18.



[Watch Video Solution](#)

53. Is 292 a term of the A.P. series 1,4,7,10,.....? Explain.



[Watch Video Solution](#)

54. In an A.P the 1st term is $2\sqrt{2}$ and the 13th term is $8\sqrt{2}$.

Find the common difference.



Watch Video Solution

55. The 12th term and 15th term of an AP are 68 and 86 respectively. Find its 18th term



Watch Video Solution

56. If A.M. and GM. of two positive numbers a and b are 10 and 8, respectively find the numbers.



[Watch Video Solution](#)

57. Find the sum of first n terms and the sum of first 5

terms of the geometric series $1 + \frac{2}{3} + \frac{4}{9} + \dots$



[Watch Video Solution](#)

58. Find the sum of the sequence $7, 77, 777, 7777, \dots$ to

n terms.



[Watch Video Solution](#)

59. How many numbers divisible by 17 are there in between 25 and 450 ?

 [Watch Video Solution](#)

60. For what value of x , the number $-\frac{2}{7}, x, -\frac{2}{7}$ are in G.P.?

 [Watch Video Solution](#)

61. Insert three geometric mean (GM) between 1 and $\frac{1}{16}$.

 [Watch Video Solution](#)

62. Find three numbers in G.P. whose sum is 19 and product is 216.

 [Watch Video Solution](#)

63. If a, b, c are respectively the p^{th}, q^{th} and r^{th} terms of a G.P. show that

$$(q - r)\log a + (r - p)\log b + (p - q)\log c = 0.$$

 [Watch Video Solution](#)

64. Find the 12^{th} term of the sequences -6,-18,-54,.....



[Watch Video Solution](#)

65. Find the sum of $2+4+8+16+\dots$ to 8 terms.



[Watch Video Solution](#)

66. $1.3 + 3.5 + 5.7 + \dots$. n terms =



[Watch Video Solution](#)

67. Find the value of 'a' if $(2a+1), a, (3a+2)$ are in G.P?



[Watch Video Solution](#)

68. Statement -1: The sum of the series

$$\frac{1}{1!} + \frac{2}{2!} + \frac{3}{3!} + \frac{4}{4!} + \dots \rightarrow \infty \text{ is } e$$

Statement 2: The sum of the series

$$\frac{1}{1!}x + \frac{2}{2!}x^2 + \frac{3}{3!}x^3 + \frac{4}{4!}x^4 \dots \rightarrow \infty \text{ is } xe^x$$



[Watch Video Solution](#)

69. Prove that

$$\frac{x}{1!} + \frac{2x^2}{2!} + \frac{3x^3}{3!} + \frac{4x^4}{4!} + \dots = xe^x$$



[Watch Video Solution](#)

70. Prove that

$$\frac{1^2}{1!} + \frac{2^2}{2!} + \frac{3^2}{3!} + \frac{4^2}{4!} + \dots = 2e$$



Watch Video Solution

71. Prove that

$$\frac{1^3}{1!} + \frac{2^3}{2!} + \frac{3^3}{3!} + \frac{4^3}{4!} + \dots = 5e$$



Watch Video Solution

72. Prove that

$$\frac{1}{3} + \frac{1}{3 \cdot 3^3} + \frac{1}{5 \cdot 3^5} + \dots = \frac{1}{2} \log 2$$



Watch Video Solution

 Watch Video Solution

73. If $1 - \frac{1}{2} + \frac{1}{3} - \frac{1}{4} + \dots = \log_e 2$, then sum

$$\frac{1}{1.3} + \frac{1}{2.5} + \frac{1}{3.7} + \frac{1}{4.9} + \dots$$



Watch Video Solution

74. Prove that,

$$\frac{1.3}{1!} + \frac{2.4}{2!} + \frac{3.5}{3!} + \frac{4.6}{4!} + \dots = 4e$$



Watch Video Solution

75. Show that, $\frac{1}{1-x} = 1 + x + x^2 + x^3 + \dots \infty$ if

$$|x| < 1$$



Watch Video Solution

76.
$$\frac{\frac{1}{2!} + \frac{1}{4!} + \frac{1}{6!} + \dots}{\frac{1}{1!} + \frac{1}{3!} + \frac{1}{5!} + \dots} =$$



Watch Video Solution