MATHS

BOOKS - RS AGGARWAL MATHS (HINGLISH)

SOME SPECIAL SERIES

Solved Examples

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

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2. Find the sum of n terms of the series whose nth term is: $n(n+3)$

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3. Find the sum to n terms of the series, whose n^{th} terms is given by : $(2n-1)^2$

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4. Find the sum to n terms of the series whose nth term is n^2+2^n.

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5. Sum the series $3.\ 8 + 6.\ 11 + 9.\ 14 +$ to n terms.

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6. Find the sum of n terms of the series $1 \cdot 2 \cdot 3 + 2 \cdot 3 \cdot 4 + 3 \cdot 4 \cdot 5 \ldots\ldots\ldots .$

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7. Find the sum of the series $1^2 + 3^2 + 5^2 + \rightarrow n$ terms.

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8. Find the sum to n terms of the series :

$1^2 + (1^2 + 2^2) + (1^2 + 2^2 + 3^2) + \vdots$

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9. Show that

$$\frac{1 \times 2^2 + 2 \times 3^2 + \vdots + n \times (n+1)^2}{1^2 \times 2 + 2^2 \times 3 + \vdots + n^2 \times (n+1)} = \frac{3n+5}{3n+1}.$$

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10. Find the sum of n terms of the series

$$\frac{1}{(2 \times 5)} + \frac{1}{(5 \times 8)} + \frac{1}{(8 \times 11)} + \ldots.$$

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11. Find the sum of first n terms of the following series:

$5 + 11 + 19 + 29 + 41 + \cdot$

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12. Find the sum of the first n terms of the series :

$3 + 7 + 13 + 21 + 31 + \vdots$

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13. Find the 50th term of the series

$2 + 3 + 6 + 11 + 18 + \ldots..$

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14. Find the sum of series $(3^3 - 2^3) + (5^3 - 4^3) + (7^3 - 6^3) +$ to n terms

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Exercise 13 A

1. Find the sum of the series whose nth term is given by:

$(3n^2 + 2n)$

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2. Find the sum to n term of the series whose nth term is $n(n+1)(n+4)$

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3. Find the sum of the series whose nth term is given by:

$\left(4n^3+6n^2+2n\right)$

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4. Find the sum of the series whose nth term is given by:

$\left(3n^2-3n+2\right)$

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5. Find the sum of n terms of the series whose nth term is: $2n^2 - 3n + 5$

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6. Find the sum of n terms of the series whose nth term is: $n^3 - 3^n$

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7. Find the sum of the series:

$(2^2 + 4^2 + 6^2 + 8^2 + \ldots \text{to n terms})$

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8. Find the sum of the following series to n term:

$2^3 + 4^3 + 6^3 + 8^3 +$

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9. Find the sum to n terms of the series :

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

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10. Find the sum to n terms of the series

$1 \times 2 + 2 \times 3 + 3 \times 4 + 4 \times 5 + ...$

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11. Find the sum to n terms of the series : $3 \times 8 + 6 \times 11 + 9 \times 14 + \vdots$

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12. Find the sum of the series:

$1 \times 2^2 + 2 \times 3^2 + 3 \times 4^2 + \ldots \text{to n terms}$

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13. Find the sum of the series:

$1 \times 2^2 + 3 \times 3^2 + 5 \times 4^2 + \ldots \text{to n terms}$

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14. Find the sum of the following series to n term:

$3 \times 1^2 + 5 \times 2^2 + 7 \times 3^2 +$

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15. Find the sum to n terms of the series :

$1 \times 2 \times 3 + 2 \times 3 \times 4 + 3 \times 4 \times 5 + \vdots$

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16. Find the sum of the series:

$(1 \times 2 \times 4) + (2 \times 3 \times 7) + (3 \times 4 \times 10) + \ldots \text{to n terms}$

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17. Find the sum to n terms of the series :

$\frac{1}{1 \times 2} + \frac{1}{2 \times 3} + \frac{1}{3 \times 4} + \vdots$

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18. Find the sum of the series:

$\frac{1}{(1 \times 3)} + \frac{1}{(3 \times 5)} + \frac{1}{(5 \times 7)} + \ldots + \frac{1}{(2n-1)(2n+1)}$

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19. Sum the following series to n terms:

$$\frac{1}{1.6}+\frac{1}{6.11}+\frac{1}{11.16}+\frac{1}{16.21}++\frac{1}{(5n-4)(5n+1)}$$

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20. Find the sum of the series

$$\frac{1^3}{1}+\frac{1^3+2^3}{1+3}+\frac{1^3+2^3+3^3}{1+3+5}+$$ up to n terms.

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21. Find the sum to n terms of the series

$$3+15+35+63+$$

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22. Find the sum to n terms of the series: $1 + 5 + 12 + 22 + 35 +$

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23. Find the sum of the following series to n terms $5 + 7 + 13 + 31 + 85 +$

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24. If $S_k = \frac{1 + 2 + 3 + ...k}{k}$ then find the value of $S_1^2 + S_2^2 + ... S_n^2$

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25. let S_n denote the sum of the cubes of the first n natureal numbers and S_n denote the sum of the fisrt n natural numbers , then $\sum_{r=1}^{n} \frac{S_r}{S_4}$ equals to

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Exercise 13 B Very Short Answer Questions

1. Find the sum $(2 + 4 + 6 + 8 + \ldots + 100)$.

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2. Find the sum $(41 + 42 + 43 + \ldots + 100)$.

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3. Find the value of $11^2 + 12^2 + 13^2 + \ + 20^2$.

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4. Find the sum $\left\{(6)^3 + (7)^3 + (8)^3 + (9)^3 + (10)^3\right\}$.

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5. If $\sum_{k=1}^{n} k = 210$, find the value of $\sum_{k=1}^{n} k^2$.

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6. If $\sum_{k=1}^{n} k = 45$, find the value of $\sum_{k=1}^{n} k^3$.

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7. Find the sum of the series $2^2 + 4^2 + 6^2 + + (2n)^2$

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8. The sum of 10 terms of the series $\sqrt{2} + \sqrt{6} + \sqrt{18} + \ldots$ is

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9. Write the sum of n term fo a series whose r^{th} term is:

$r + 2^r$.

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