MATHS

BOOKS - NCERT MATHS (ENGLISH)

SEQUENCE AND SERIES

Short Answer Type Questions

1. The first term of an A.P. is a and the sum of first p terms is zero, show that the sum of its next q terms is $\frac{-a(p+q)q}{p-1}$.

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2. A man saved Rs. 66000 in 20 years. In each succeeding year after the first year he saved Rs. 200 more than what he saved in the previous year. How much did he save in the first year?

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3. A man accepts a position with an initial salary of Rs. 5200 per month. It is understood that the will receive an automatic increase of Rs. 320 in the very next month and each month thereafter. Find his salary for the tenth month What is his total earnings during the first year?

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4. If the $p^{th} and q^{th}$ terms of a G.P. are $q and p$ respectively, show that $(p+q)^{th}$ term is $\left(\frac{q^p}{p^q}\right)^{\frac{1}{p-q}}$.

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5. A carpenter was hired to build 192 window frames. The first day he made five frames and each day thereafter he made two more frames than he made the day before. How many days did it take him to finish the job?

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6. We know that the sum of the interior angles of a triangle is 180^0. Show that the sums of eth interior angles of polygons

with $3, 4, 5, 6,$ sides for an arithmetic progression. Find the sum of the interior angles of or a 21 sided polygon.

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7. A side of an equilarteral triangle is 20 cm long .A second equilateral triangle is inscribed in it by joning the mid -point of the sides of the first triangle . The process is caontinued as shown in the accompanying diagram . find the perimeter of the sixth inscribed equilateral triangle .

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8. In a potato race 20 potatoes are placed in a line at intervals of $4 meters$ with first potato $24 metres$ from the starting point. A constant is required to bring the potatoes back to the starting

place one at a time. How far would he run in bringing back all the potatoes?

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9. about to only mathematics

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10. If $a_1, a_2, a_3, , a_n$ are in A.P., where $a_i > 0$ for all i , show that

$$\frac{1}{\sqrt{a_1}+\sqrt{a_2}}+\frac{1}{\sqrt{a_1}+\sqrt{a_3}}+ +\frac{1}{\sqrt{a_{n-1}}+\sqrt{a_n}}=\frac{n-1}{\sqrt{a_1}+\sqrt{a_n}}.$$

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

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12. Find the rth term of an AP sum of whose first n terms is $2n + 3n^2$.

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Long Answer Type Questions

1. If G_1 and G_2 are two geometric means inserted between any two numbers and A is the arithmetic mean of two numbers, then the value of $\frac{G_1^2}{G_2} + \frac{G_2^2}{G_1}$ is:

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2. If $\theta_1, \theta_2, \theta_3, , \theta_n$ are in AP, whose common difference is d , show that $\sec\theta_1 sec\theta_2 + sec\theta_2 \sec\theta_3 + \ + \sec\theta_{n-1} \sec\theta_n = \frac{\tan\theta_n - \tan\theta_1}{\sin d}$

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3. If the sum of p terms of an AP is q and the sum of q terms is p, then show that the sum of $p + q$ terms is $-(p + q)$, Also find the sum of first $p - q$ terms (where , $p > q$).

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4. If the $pth, qth\ and\ rth$ terms of a G.P. are a, b, c respectively, prove that: $a^{(q-r)} \dot{\frown} ( ) b^{(r-p)} \dot{c}^{(p-q)} = 1.$

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Objective Type Question

1. The sum of first n terms of an AP is given by $S_n = 2n^2 + 3n$.

Find the common difference of the AP.

A. 3

B. 2

C. 6

D. 4

Answer: D

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2. If the third term of G.P.is 4, then find the product of first five terms

A. 4^3

B. 4^4

C. 4^5

D. None of these

Answer: C

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3. if 9 times the 9 th term of an AP is equal to 13 times the 13 th term , then the 22 nd term of the AP is

A. 0

B. 22

C. 198

D. 220

Answer: A

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4. if x , 2y and 3z are in AP where the distinct numbers x, yand z are in gp. Then the common ratio of the GP is

A. 3

B. $\frac{1}{3}$

C. 2

D. $\frac{1}{2}$

Answer: B

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5. If in an AP, $S_n = qn^2$ and $S_m = qm^2$, where S_r denotes the of r terms of the AP , then S_q equals to

A. $\frac{q^3}{2}$

B. mnq

C. q^3

D. $(m+n)q^2$

Answer: C

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6. Let S_n denote the sum of first n terms of an AP and $3S_n = S_{2n}$ What is $S_{3n} : S_n$ equal to?

A. 4

B. 6

C. 8

D. 10

Answer: B

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7. The minimum value of $4^x + 4^{1-x}, x \in \mathbb{R}$ is

A. 2

B. 4

C. 1

D. 0

Answer: B

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

A. $\frac{n(n+1)(n+2)}{6}$

B. $\frac{n(n+1)}{2}$

C. $\frac{n^2+3n+2}{2}$

D. None of these

Answer: A

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9. If t_n denotes the nth term of the series $2+3+6+11+18+\ldots$then t_{50}=..... 49^2-1 b. 49^2 c. 50^2+1 d. 49^2+2

A. 49^2-1

B. 49^2

C. 50^2+1

D. 49^2+2

Answer: D

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10. The lengths of three unequal edges of a rectangular solids block are in GP . if the volume of the block is $216cm^3$ and the total surface area is $252cm^2$ then the length of the longest edge is

A. 12cm

B. 6 cm

C. 18 cm

D. 3 cm

Answer: A

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Fillers

1. If a, b, c are in AP or GP or HP, then $\frac{a-b}{b-c}$ is equal to

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2. Show that in an A.P. the sum of the terms equidistant from the beginning and end is always same and equal to the sum of first and last terms.

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3. If the third term of G.P.is 4, then find the product of first five terms

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True False

1. Two sequences cannot be in both AP and GP together .

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2. Every proression is a sequence but the converse i.e., every sequence is also a progression need not mecessarily be true.

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3. Any term of an AP (except first) is equal to half the sum of terms which are equidistant from it .

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4. the sum of difference of two GP . Is again a GP.

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5. If the sum of n terms of a sequence is quadratic expression it always represents an AP.

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Match The Comumms

1. match the following .

	columnI		columnII
(i)	$4.1.\frac{1}{4}.\frac{1}{16}$	(a)	AP
(ii)	$2.3.5.7$	(b)	sequence
(iii)	$13.8.3.-2.-7$	(c)	GP

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2. Match the following .

	ColumnI		ColumnII
(i)	$1^2+2^2+3^2+\ldots.+n^2$	(a)	$\left[\frac{n(n+1)}{2}\right]^2$
(ii)	$1^3+2^3+3^3+\ldots+n^3$	(b)	$n(n+1)$
(iii)	$2+4+6+\ldots+2n$	(c)	$\frac{n(n+1)(2n+1)}{6}$
(iv)	$1+2+3+\ldots+n$	(d)	$\frac{n(n+1)}{2}$

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