MATHS

BOOKS - PATHFINDER MATHS (BENGALI ENGLISH)

SEQUENCES AND SERIES

Question Bank

1. In an A.P. if p^{th} term is $\dfrac{1}{q}$ and q^{th} term is $\dfrac{1}{p}$, prove that the sum of first pq terms is

$$\frac{1}{2}(pq + 1)$$, where $p \neq q$.

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

3. If $\dfrac{a^{n+1} + b^{n+1}}{a^n + b^n}$ is the A.M between a and b then find the value of n.

4. If the pth, q^{th} and r^{th} terms of a G.P. are a, b and c, respectively. Prove that $a^{q-r}b^{r-p}c^{P-q}$ = 1.

5. If $\dfrac{a+bx}{a-bx} = \dfrac{b+cx}{b-cx} = \dfrac{c+dx}{c-dx}$ (x+-0) then show a,b,c and d are in G.P

6. Sum to n term .7+.77+.777.......

7. 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.

8. The sum of n term of three A.P are S_1, S_2, and S_3. The frist term of each is 1 and common diffrence are 1,2,3 repectively .Prove that $S_1 + S_3$=2 S_2.

9. 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.

10. Find the sum of the following series up to n terms:

$$\frac{1^3}{1} + \frac{1^3 + 2^3}{1 + 3} + \frac{1^3 + 2^3 + 3^3}{1 + 3 + 5} + \ldots\ldots$$

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11. Find the sum of the infinite series

$$1 + \frac{2}{3} + \frac{3}{3^2} + \frac{4}{3^3} + \ldots\ldots$$

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12. Find the sum of n terms of the series

3+7+14+24+37+.....

13. If the sum of n terms of an A.P. is $\left(pn + qn^2\right)$, where p and q are constants, find the common difference.

14. 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.

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

16. 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.

17. If the first and the nth term of a G.P. are a and b, respectively, and if P is the product of n terms, prove that $P^2 = (ab)^n$.

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

$$1^2 + \left(1^2 + 2^2\right) + \left(1^2 + 2^2 + 3^2\right) + \dots$$

19. Let the sum of n, 2n, 3n terms of an A.P. be S_1, S_2 and S_3 , respectively, show that

$$S_3 = 3(S_2 - S_1)$$

20. The p th ,q th and r th terms of an A.P are a,b,c respectively. Show that (p-r)a+(r-p)b+(p-q) c=0

21. A man saves Rs 32 during frist year Rs.36 in the next year and Rs.40 in the third year . If he continues his savings in this sequence in how many year will he save Rs.2000 ?

22. If $\dfrac{1}{x+y}$, $\dfrac{1}{2y}$, $\dfrac{1}{y+t}$ are in A.P . Prove that x,y,t are in G.P.

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23. If one A.M 'a' and two GM's p and q be inserted between any two given number, show $p^3 + q^3 = 2apq.$

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