



INDIAN SCHOOL MUSCAT
DEPARTMENT OF MATHEMATICS
CLASS XI
WORKSHEET NO. 9
SEQUENCES AND SERIES

1.	Which term of the G.P 18 , -12 , 8 , ... is $\frac{512}{729}$ (Ans:9 th term)
2.	Insert 4 geometric means between 6 and 192. (Ans:12, 24, 48,96)
3.	If a, b , c are in A.P, then find the value of $\frac{(a-c)^2}{b^2-ac}$ (Ans:4)
4.	The product of first three terms of a G.P. is 1000. If we add 6 to its second term and 7 to its third term, the three terms form an A.P. Find the terms of the G.P. (Ans:5, 10, 20; 20, 10, 5)
5.	The first term of a G.P is 1 and the sum of the third and fifth term is 90. Find the common ratio and 10th term of the G.P.(Ans:r =±3;±729)
6.	If a, b, c, d are in G.P., prove that $a^2 - b^2, b^2 - c^2, c^2 - d^2$ are also in G.P
7.	The inventor of the chess board suggested a reward of one grain of wheat for the first square, 2 grains for the second, 4 grains for the third and so on, doubling the amount of the grains for subsequent squares. How many grains would have to be given to the inventor? (There are 64 squares in the chess board) (Ans: $2^{64} - 1$)
8.	Three numbers are in A.P and their sum is 15. If 1 , 3, 9 be added to them respectively, they form a G.P, find the numbers. (Ans:3, 5, 7; 15, 5, -5)
9.	Find the natural number a for which $\sum_{k=1}^n f(a+k) = 16(2^n - 1)$ Where the function f satisfies $f(x+y)=(x).(y)$ for all natural number x,y such that $f(1)=2$.(Ans: a = 3).
10.	If there are $(2n + 1)$ terms in an A.P., then prove that the ratio of the sum of odd terms and the sum of even terms is $(n + 1) : n$
11.	If the p^{th}, q^{th} and r^{th} terms of a G.P. are a, b and c respectively. Prove that $a^{q-r} . b^{r-p} . c^{p-q} = 1$
12.	Find the sum of first 24 terms of the A.P. a_1, a_2, a_3, \dots if it is known that $a_1 + a_5 + a_{10} + a_{15} + a_{20} + a_{24} = 225$.
13.	If p,q,r are in G.P. and the equations $px^2+2qx+r=0$ and $dx^2+2ex+f=0$ have a common root, then show that $\frac{d}{p} . \frac{e}{q} , \frac{f}{r}$ are in A.P.
14.	Evaluate $\sum_{k=1}^{11}(2 + 3k)$ (Ans: $\frac{41+3^{12}}{2}$)
15.	Find the sum of the products of the corresponding terms of the sequences 2,4,8,16,32 and 128,32,8,2, $\frac{1}{2}$ (Ans: Sum =496)
16.	The first term of an A.P. is a, the second term is b and the last term is c. Show that the sum of the A.P. is $\frac{(b+c-2a)(c+a)}{2(b-a)}$.
17.	If a_1, a_2, \dots, a_n are in A.P. with common difference d (where $d \neq 0$); then the sum of the series $\sin d$ ($\operatorname{cosec} a_1 \operatorname{cosec} a_2 + \operatorname{cosec} a_2 \operatorname{cosec} a_3 + \dots + \operatorname{cosec} a_{n-1} \operatorname{cosec} a_n$) is equal to $\cot a_1 - \cot a_n$.
18.	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. (Ans:2046)
19.	We know the sum of the interior angles of a triangle is 180° . Show that the sums of the interior angles of polygons with 3, 4, 5, 6, ... sides form an arithmetic progression. Find the sum of the interior angles for a 21 sided polygon.(Ans. 3420^0)