PreAP Precalculus
Unit 4 Test Review Name: _____

*SEQUENCES AND SERIES*

| **ARITHMETIC** | **GEOMETRIC** |
|---|---|
| **Explicit:** $a_n = dn + a_0$ **or** $a_n = a_1 + d(n-1)$ | **Explicit:** $a_n = a_1 \cdot r^{n-1}$ **or** $a_n = a_0 \cdot r^n$ |
| **Summation:** $S_n = \frac{n}{2}(a_1 + a_n)$ | **Finite Summation:** $S_n = \frac{a_1(1-r^n)}{1-r}$ |
| | **Infinite Summation:** $S = \frac{a_1}{1-r}$ |

1) Write the first five terms and then write the explicit equation for the following sequences…

_____ A) $a_1 = \frac{-1}{2}, d = 2$ _____ B) $a_1 = \frac{2}{3}, r = \frac{-1}{2}$

2) Given $a_2 = 9$ and $a_{k+1} = a_k - 3$, find $a_5$.

#3-6, Find the explicit equation and then find the indicated term.

_____ 3) If the 3rd term of an arithmetic sequence is 94 and the 6th term is 85, find the 15th term.

_____ 4) If the 4th term of a geometric sequence is -18 and the 7th is $\frac{2}{3}$, find $a_{10}$

_____ 5) If the 4th term of an arithmetic sequence is 27 and the 9th term is 7, find $a_{65}$

_____ 6) If the 3rd term of a geometric sequence is -32 and the 6th term is 2048, find the $10^{th}$ term.

#7-8, Find the indicated partial sum of the following sequences.

_____ 7) Find $\sum_{i=0}^{3}(2i+5)$

_____ 8) $\sum_{n=1}^{5}5\left(\frac{1}{2}\right)^{n-1}$

#9-13, Find the indicated partial sum of the following sequences.

_____ 9) 40, 37, 34, 31, … n = 25

_____ 10) If $a_n = 5n-1$ find $S_{70}$

_____ 11) If $a_n = \frac{1}{2}(-3)^n$ find $S_{14}$

_____ 12) Find $S_{60}$ of the series 2, 6, 10, 14, …

_____ 13) Find $S_5$ for $5, \frac{-5}{3}, \frac{5}{9}, \frac{-5}{27}, \cdots$

14) A paper manufacturer buys a machine for $120,000. At the end of each year the depreciated value will be 70% of what it was at the beginning of the year. Find the depreciated value of the machine after 5 full years.

#15-18, Find the sum of the infinite geometric series.

15) $\sum_{i=1}^{\infty}\left(\frac{7}{8}\right)^{i-1}$

16) $\sum_{i=1}^{\infty}(0.1)^{i-1}$

17) $\sum_{k=1}^{\infty}4\left(\frac{2}{3}\right)^{k-1}$

18) $\sum_{i=1}^{\infty}-4\left(\frac{5}{2}\right)^{n}$

#19-20, Use Pascal's Triangle to expand and simplify the expression.

19) $(x + 4)^4$

20) $(a - 3b)^5$