

## Pre-AP Pre- Calculus Sequences and Series Test Review

1. Write the sum using sigma notation.

$$9 - 10x + 11x^2 - 12x^3 + \dots + 97x^{88}$$

2. Find the sum.

$$\sum_{k=1}^4 k 2^k$$

3. Write the following sum using sigma notation.

$$1 - 5x^4 + 9x^8 - 13x^{12} + \dots + 121x^{120}$$

4. The first term of the arithmetic sequence  $a$  is 4 and common difference  $d$  is 6. Find the  $n$ th term and the 10th term.

5. Find the first five terms and determine if the sequence is arithmetic.

$$a_n = 2 + 6n$$

6. Find the 60th term of the arithmetic sequence.

$$26.2, 29.9, 33.6, 37.3, \dots$$

7. Find the  $n$ th term of the arithmetic sequence.

$$2, 2 + s, 2 + 2s, 2 + 3s, \dots$$

8. Find the 18th term of the arithmetic sequence.

$$-t, -t + 3, -t + 6, -t + 9 \dots$$

9. Which term of the arithmetic sequence 3, 8, 13,... is 73?

10. A partial sum of an arithmetic sequence is given. Find the sum.

$$3 + 7 + 11 + \dots + 39$$

11. Determine whether the sequence

$$6, 24, 96, 384, \dots$$

is geometric. If it is geometric, find the common ratio.

12. Determine the common ratio, the 6th term, and the  $n$ th term of the geometric sequence.

$$4, 12, 36, 108, \dots$$

13. Determine the  $n$ th term of the geometric sequence.

$$x, \frac{x^2}{5}, \frac{x^3}{25}, \frac{x^4}{125}, \dots$$

14. Which term of the geometric sequence 5, 20, 80, . . . is 20480?

15. Find the sum.

$$1 + 4 + 16 + \dots + 4096$$

16. Find the sum of the infinite geometric series.

$$1 + \frac{1}{3} + \frac{1}{9} + \frac{1}{27} + \dots$$

17. Use the Binomial Theorem to expand the expression  $(3 - x)^5$ .

18. Find the first three terms in the expansion of  $(x + 2y)^{15}$ .

19. Find the middle term in the expansion of  $(x^4 + 1)^{20}$ .

20. Find the term containing  $x^6$  in the expansion of  $(x + 2y)^{10}$ .

21. Find the sum.

$$\sum_{k=2}^6 2^{k-2} = \underline{\hspace{2cm}}$$

22. The 12th term of an arithmetic sequence is 34, and the fifth term is 20. Find the 20th term.

$$a_{20} = \underline{\hspace{2cm}}$$

23. The first term of an arithmetic sequence is 3, and the common difference is 2. Is 5,981 a term of this sequence? If so, which term is it?

24. A partial sum of an arithmetic sequence is given. Find the sum.

$$-30 - 29.7 - 29.4 - \dots - 0.3$$

$$S = \underline{\hspace{2cm}}$$

25. A partial sum of an arithmetic sequence is given. Find the sum.

$$\sum_{n=0}^{20} (1 - 7n)$$

$$S = \underline{\hspace{2cm}}$$

26. An arithmetic sequence has first term  $a_1 = 7$  and fourth term  $a_4 = 22$ . How many terms of this sequence must be added to get 3,402?

$$n = \underline{\hspace{2cm}}$$

27. Determine whether the sequence is geometric. If it is geometric, find the common ratio.

$$1.0, 1.3, 1.69, 2.197, \dots$$

28. Which term of the geometric sequence 2, 4, 8, ... is 4,096?

\_\_\_\_\_ th term

29. The second and the fifth terms of a geometric sequence are 4 and 32, respectively. Is 512 a term of this sequence? If so, which term is it?

30. Find the sum of the infinite geometric series.

$$4 + \frac{4}{3} + \frac{4}{9} + \frac{4}{27} + \dots$$

31. Find the sum.

$$\sum_{k=1}^5 \frac{11}{k} = \underline{\hspace{2cm}}$$

32. Write the sum using sigma notation.

$$4 + 8 + 12 + 16 + 20 + 24 + 28 + 32 + 36 + 40$$

33. Determine whether the sequence is arithmetic. If it is arithmetic, find the common difference.

$$5, 11, 13, 23, \dots$$

34. Find the sum.

$$1 - \frac{1}{2} + \frac{1}{4} - \frac{1}{8} + \dots + \frac{1}{1,024}$$

35. Find the sum of the infinite geometric series.

$$1 + \frac{1}{3} + \frac{1}{9} + \frac{1}{27} + \dots$$

36. Find the sum of the infinite geometric series.

$$\frac{2}{7} - \frac{8}{49} + \frac{32}{343} - \dots$$