

Alg 2 Review: Topic 1 Written Portion Fall 2019

For each sequence in 1 to 8 do the following:

- a) State if it is Arithmetic, Geometric, or Neither b) State the next three terms
c) If it's Arithmetic state the common difference and if it's Geometric state the common ratio.

1. 13, 17, 25, 37, 53, ... 2. 96, 240, 600, 1500, ... 3. 185, 178, 171, 164, ...
4. 139968, 23328, 3888, 648, 5. 9, 9, 27, 135, 945, ... 6. 500, 499, 495, 486, 470, ...
7. 6, -12, -48, 288, 2304, ... 8. -113, -99.5, -86, -72.5, ...

Use each formula to find the first 5 terms in the sequence.

9. $t_1 = 2$ $t_2 = 5$ $t_n = t_{n-1} + 2 \cdot t_{n-2}$ 10. $t_n = 11(2)^{n-1}$

11. $t_1 = 4$ $t_n = t_{n-1} - 6$

Write a recursive and explicit formula for each sequence.

12. 12, 28, 44, 60, 76, ... 13. 6, 42, 294, 2058, 14406, ...

Write each series in Sigma Notation.

14. $5 + 15 + 45 + 135 + 405 + 1215$ 15. $16 + 9 + 2 + -5 + \dots + -54$

Find each sum.

16. The first 13 terms of the sequence defined by this explicit formula: $t_n = 17 + 8(n - 1)$

17. The series defined by: $\sum_{n=1}^9 3(4)^{n-1}$

18. Find the sum of each infinite series, if it exists.

- a) 13, 9, 5, 1, -3, -7, ... b) 5120, 1280, 320, 80, ... c) 972, -324, 108, -36, ... d) 14, 84, 504, 3024, ...

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ANSWERS

1. a) Neither b) 73, 97, 125 2. a) Geometric b) 3750, 9375, 23437.5 c) $r = 2.5$
3. a) Arithmetic b) 157, 150, 143 c) $d = -7$ 4. a) Geometric b) 108, 18, 3 c) $r = \frac{1}{6}$
5. a) Neither b) 8505, 93555, 1216215 6. a) Neither b) 445, 409, 360
7. a) Neither b) -23040, -276480, 3870720
8. a) Arithmetic b) -59, -45.5, -32 c) $d = 13.5$
9. 2, 5, 9, 19, 37 10. 11, 22, 44, 88, 176 11. 4, -2, -8, -14, -20
12. Recursive: $t_1 = 12$ $t_n = t_{n-1} + 16$ Explicit: $t_n = 12 + 16(n - 1)$
13. Recursive: $t_1 = 6$ $t_n = (t_{n-1}) \cdot 7$ Explicit: $t_n = 6(7)^{n-1}$
14. $\sum_{n=1}^6 5(3)^{n-1}$ 15. $\sum_{n=1}^{11} 16 + -7(n - 1)$ 16. 845 17. 262, 143
18. a) Sum doesn't exist - Series is Divergent (arithmetic) b) Sum = $6826.\bar{6} = 6826\frac{2}{3}$ (geometric $r = \frac{1}{4}$)
c) Sum = 729 (geometric $r = \frac{-1}{3}$) d) Sum doesn't exist- Series is Divergent (geometric $r > 1$)