

## Algebra II Sequence and Series Review

Determine whether each sequence is *arithmetic* or *geometric*. Then identify the common difference or the common ratio.

1) 3, 18, 33, 48, ...

2)  $1, \frac{1}{2}, \frac{1}{4}, \frac{1}{8}, \dots$

3) 7, 10, 13, 16, ...

4) 3, 3.6, 4.32, 5.184, ...

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Determine whether each sequence is *arithmetic* or *geometric*. Then find the ninth term.

5) 23, 27, 31, 35, 39, ...

6) -12, -5, 2, 9, 16, ...

7) -5, 15, -45, 135, -405, ...

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Generate the first four terms of each sequence;  $r$  is a common ratio, and  $d$  is a common difference.

8)  $a_1 = 2, r = -2$

9)  $a_1 = 3, d = 7$

10)  $a_1 = -100, r = \frac{1}{5}$

11)  $a_1 = 19, d = -4$

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12) Use the sequence to answer the following questions: 4.5, 3.3, 2.1, ...

A.  $a_6 =$

B. Recursive form:

C. Explicit/Closed Formula:

D.  $a_{40} =$

13) Use the sequence to answer the following questions: 8, 12, 16, ...

A.  $a_7 =$

B. Recursive Form:

C. Explicit/ Closed Form:

D.  $a_{72} =$

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Find the next three terms in each geometric sequence.

14) -5, 15, -45, 135, -405, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_

15) 216, -36, 6, -1, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_

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Tell whether the sequence is geometric. If yes, write the explicit and recursive formula.

16)  $100, 50, 25, \frac{25}{2}, \frac{25}{4}, \dots$

17)  $1, 3, 5, 7, \dots$

18)  $-6, -2, -\frac{2}{3}, -\frac{2}{9}, \dots$

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Find the missing term.

19) If  $a_n = \frac{1}{5} a_{n-1}$  and  $a_1 = -100$ , what is  $a_6$ ?

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Find the sum to the given term.

20)  $5000 + 1000 + 200 + \dots; S_{15}$

21)  $\sum_{k=1}^6 (-2)^{k-1}$

22)  $6 + 0.6 + 0.06 + 0.006 + \dots; S_8$

23)  $\sum_{k=1}^5 18 \left(\frac{1}{6}\right)^{k-1}$

24)  $\sum_{n=1}^5 (3n+1)$

25)  $7 + 14 + 21 + 28 + \dots; S_9$

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Find  $S_n$  for each arithmetic series.

26)  $a_1 = 50, n = 20, d = -4$

27)  $a_1 = 76, n = 16, a_n = 31$

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Find  $a_1$  for each geometric series.

28)  $S_n = 1031, r = \frac{2}{5}, n = 5$

29)  $S_n = -61, n = 5, r = -1$