

# Algebra II Topics and Assignments

## Unit 7: Sequences & Series

**Topic:** Arithmetic Sequences

**Assignment:** 7-1 p.663 #15-26, 30, 31, 33, 34, 37, 65-79 odd

**Topic:** Arithmetic Series

**Assignment:** 7-2 p.663 #1-3, 10-14, 45-48, 51-53, 57, 58, 61, 64-76 even

**Topic:** Geometric Sequences

**Assignment:** 7-3 p.670 #24-29, 33-41, 45-47, 93-97 odd

**Topic:** Geometric Series

**Assignment:** 7-4 p.671 #60, 61, 64, 65, 69-71, 92-96 even  
p.673 #7-14

**Topic:** Infinite Geometric Series

**Assignment:** 7-5 p.678 #1-8, 13, 15, 19, 22, 26, 28, 62, 65-69 odd

**Topic:** Review

**Assignment:** 7-6 p.692 #1-9, 15-24, 25-45 odd

**Topic:** Recursive Sequences

**Assignment:** 7-7 p.684 #5, 7, 8, 15, 18, 56, 67-69, 71, 72, 74, 79, 82, 83  
p.687 #2, 5, 6, 11, 13

**Topic:** Practice Test

**Assignment:** 7-8 Practice Test (Supplement p.7-2 through 7-4)

**Topic: Unit 7 Test:** Sequences and Series

**Assignment:** 7-9 TBA

**Sequences & Series**  
Practice Test

Name \_\_\_\_\_  
Period \_\_\_\_\_ Date \_\_\_/\_\_\_/\_\_\_

Show your work here or on a separate piece of paper. Put all final answers in the answer column.

1. What are the missing terms in the arithmetic sequence 63, \_\_\_\_, \_\_\_\_, 30?

1. \_\_\_\_\_

2. What is  $S_n$  for the arithmetic series in which  $a_1 = 5$ ,  $d = 2$ , and  $a_n = 33$ ?

2. \_\_\_\_\_

3. What is the 1<sup>st</sup> term of the arithmetic series in which  $a_8 = -14$ , and  $S_8 = 0$ ?

3. \_\_\_\_\_

4. What is the common ratio for the geometric sequence 3888, 2592, 1728, ...?

4. \_\_\_\_\_

5. What is the 6<sup>th</sup> term in the geometric sequence in which  $a_1 = 3$  and  $r = -3$ ?

5. \_\_\_\_\_

6. What is  $S_6$  for the geometric series in which  $a_3 = 9$  and  $a_4 = -27$ ?

6. \_\_\_\_\_

7. What is the 1<sup>st</sup> term of the geometric series in which  $S_7 = 65532$  and  $r = 4$ ?

7. \_\_\_\_\_

Tell whether the sequence is *arithmetic*, *geometric*, or *neither*.

8.  $-1, 1, 3, 5, \dots$

9.  $3, 8, 9, 12, \dots$

10.  $2, 4, 8, 16, \dots$

11.  $-6, -1, 4, 9, \dots$

12. What is the sum of the infinite geometric series in which  $a_1 = 7$  and  $r = \frac{3}{4}$ ?

13. What is the sum of the infinite geometric series  $10 + 6 + \frac{18}{5} + \dots$ ?

14. Write  $3 + 8 + 13 + 18 + 23$  using summation notation.

15.  $12 - 6 - 24 - 42 - \dots - 132$  is a(n) \_\_\_\_\_.  
 A. arithmetic sequence                      B. arithmetic series  
 C. geometric sequence                      D. geometric series

Find the sum of the series.

16.  $\sum_{n=1}^{25} (3n+1)$

17.  $\sum_{n=1}^6 2(4)^{n-1}$

18.  $10 + 20 + 40 + \dots + 20480$

19.  $-20 + 5 - 1.25 + 0.3125 \dots$

8. \_\_\_\_\_

9. \_\_\_\_\_

10. \_\_\_\_\_

11. \_\_\_\_\_

12. \_\_\_\_\_

13. \_\_\_\_\_

14. \_\_\_\_\_

15. \_\_\_\_\_

16. \_\_\_\_\_

17. \_\_\_\_\_

18. \_\_\_\_\_

19. \_\_\_\_\_

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28	10	B	arithmetic	25	2730	-16	840	geometric	1000
43	neither	40950		$\sum_{n=1}^5 (-2 + 5n)$					

20. What is the 157<sup>th</sup> term in the arithmetic sequence for which  $a_1 = -12$  and  $d = 5$ ?

20. \_\_\_\_\_

21. The number 749 is what term in the arithmetic sequence  $-7, 2, 11, \dots$ ?

21. \_\_\_\_\_

22. What is the 1<sup>st</sup> term of the infinite geometric series for which  $S = \frac{10}{3}$  and  $r = \frac{7}{9}$ ?

22. \_\_\_\_\_

23. Evaluate  $\sum_{n=1}^{20} (5n - 2)$ .

23. \_\_\_\_\_

**Write the next term of the sequence, and then write the rule for the  $n$ th term.**

24. 648, 216, 72, ...

24. next = \_\_\_\_\_

$a_n =$  \_\_\_\_\_

25.  $\frac{5}{3}, \frac{13}{6}, \frac{8}{3}, \frac{19}{6}, \dots$

25. next = \_\_\_\_\_

$a_n =$  \_\_\_\_\_

1) Decide whether the sequence is arithmetic. Explain why or why not.

a) 18, 11, 4, -3, -10, ...      yes/no      why? \_\_\_\_\_

b) 0, 4, 7, 11, 14, 18, ...      yes/no      why? \_\_\_\_\_

c) 2, 4, 8, 16, 32, ...      yes/no      why? \_\_\_\_\_

2) The following sequences are arithmetic sequences. Give the missing terms.

a) 1, 5, \_\_\_\_\_, \_\_\_\_\_, ...      b) -3, \_\_\_\_\_, \_\_\_\_\_, 15, ...      c) 2, \_\_\_\_\_, 7, \_\_\_\_\_, ...

3) Write a rule for the  $n^{\text{th}}$  term of the arithmetic sequence. Then find  $a_{50}$ .

a) -40, -31, -22, -13, -4, ...

b) 1415, 1399, 1383, 1367, 1351, ...

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

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

$$a_{50} = \underline{\hspace{2cm}}$$

$$a_{50} = \underline{\hspace{2cm}}$$

4) Write a rule for the  $n^{\text{th}}$  term of the arithmetic sequence given:

a)  $d = -3, a_1 = 25$

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

b)  $a_3 = 12, a_{11} = 52$

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

Answers to problems ON THE BACK:

5) a) 245    b) -23350    c) 181    b) 2,820    c) 22      Bonus: 810

5) Find the sum of the arithmetic series:

$$\text{a) } \sum_{n=1}^{10} (5n - 3)$$

$$\text{b) } \sum_{n=1}^{100} (120 - 7n)$$

$$S_{10} = \underline{\hspace{2cm}}$$

$$S_{100} = \underline{\hspace{2cm}}$$

6) For the arithmetic series below find:

a)  $a_{30}$

b)  $S_{30}$

c) find  $n$  for the given sum,  $S_n = 1540$

$$7 + 13 + 19 + 25 + 31 + \dots$$

a)  $a_{30} = \underline{\hspace{2cm}}$

b)  $S_{30} = \underline{\hspace{2cm}}$

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

Bonus:

Find the sum of  $-23 - 15 - 7 + 1 + \dots + 113$ . (Use the formulas used so far in this unit!)

Answers to problems ON THE FRONT:

1) a) yes, common difference  $+ -7$  b) no, no common difference c) no, no common difference

2) a) 1,5,9,13... b)  $-3,3,9,15\dots$  c) 2,4.5,7,9.5... 3) a)  $-49 + 9n$ ; 401 b)  $1431 - 16n$ ; 631

4) a)  $28 - 3n$  b)  $-3 + 5n$