

## 11.1-11.3: Sequences and Series Review

Date \_\_\_\_\_ Period \_\_\_\_\_

**Find the first four terms in each sequence.**

1)  $a_n = 8 + 4n$

2)  $a_n = -7 + 3n$

3)  $a_n = -7 + 30n$

4)  $a_n = -50 + 20n$

**Write the explicit formula for each sequence.**

5)  $\frac{2}{3}, \frac{4}{5}, \frac{6}{7}, \frac{8}{9}, \frac{10}{11}, \dots$

6) 4, 7, 12, 19, 28, ...

7) 4, 16, 36, 64, 100, ...

8) 2, 5, 10, 17, 26, ...

**For each sequence, state if it is arithmetic, geometric, or neither.**

9) 10.1, 10.7, 11.3, 11.9, 12.5, ...

10) -34, -4, 26, 56, 86, ...

11) 4, 16, 36, 64, 100, ...

12) -4, -12, -36, -108, -324, ...

13) -3, -9, -27, -81, -243, ...

14) 1, 9, 25, 49, 81, ...

**Rewrite each series using sigma notation.**

15)  $1 + 2 + 3 + 4 + 5 + 6$

16)  $1 + \frac{1}{2} + \frac{1}{3} + \frac{1}{4} + \frac{1}{5}$

17)  $4 + 8 + 12 + 16$

18)  $\frac{1}{2} + \frac{2}{3} + \frac{3}{4} + \frac{4}{5} + \frac{5}{6}$

**Evaluate each series.**

$$19) \sum_{k=1}^6 k(k-2)$$

$$20) \sum_{a=1}^5 (20 - a^2)$$

$$21) \sum_{m=1}^5 (m + 200)$$

$$22) \sum_{m=1}^5 3m$$

**Determine if the sequence is arithmetic. If it is, find the common difference, the 52nd term, and the explicit formula.**

$$23) 3, -6, 12, -24, \dots$$

$$24) -22, -26, -30, -34, \dots$$

$$25) 23, 17, 11, 5, \dots$$

$$26) 4, 16, 36, 64, \dots$$

**Given the first term and the common difference of an arithmetic sequence find the 52nd term and the explicit formula.**

$$27) a_1 = -12, d = -9$$

$$28) a_1 = -36, d = 7$$

$$29) a_1 = -24, d = -5$$

$$30) a_1 = 32, d = -3$$

**Given a term in an arithmetic sequence and the common difference find the 52nd term and the explicit formula.**

$$31) a_{36} = -342, d = -10$$

$$32) a_{26} = 5020, d = 200$$

$$33) a_{17} = -324, d = -20$$

$$34) a_{40} = -185, d = -4$$

**Given two terms in an arithmetic sequence find the 52nd term and the explicit formula.**

$$35) a_{14} = 22 \text{ and } a_{36} = 88$$

$$36) a_{17} = -1560 \text{ and } a_{40} = -3860$$

37)  $a_{17} = -1585$  and  $a_{39} = -3785$

38)  $a_{17} = -68$  and  $a_{39} = -200$

**Evaluate each arithmetic series described.**

39)  $\sum_{i=1}^9 (3i + 2)$

40)  $\sum_{n=1}^{14} (10n - 1)$

41)  $\sum_{i=1}^{20} (2i + 7)$

42)  $\sum_{m=1}^{15} (5m - 8)$

43)  $a_1 = 34$ ,  $d = 10$ ,  $n = 8$

44)  $a_1 = -24$ ,  $d = -8$ ,  $n = 5$

45)  $a_1 = -16$ ,  $d = -8$ ,  $n = 14$

46)  $a_1 = -28$ ,  $d = -9$ ,  $n = 45$

47)  $8 + 17 + 26 + 35\dots$ ,  $n = 10$

48)  $37 + 47 + 57 + 67\dots$ ,  $n = 20$

49)  $2 + (-3) + (-8) + (-13)\dots$ ,  $n = 7$

50)  $17 + 27 + 37 + 47\dots$ ,  $n = 18$

**Determine if the sequence is geometric. If it is, find the common ratio, the 8th term, and the explicit formula.**

51) 10, 12, 15, 19, ...

52) -2, 12, -72, 432, ...

53) -2, -4, -12, -48, ...

54) -4, -20, -100, -500, ...

**Given the first term and the common ratio of a geometric sequence find the 8th term and the explicit formula.**

55)  $a_1 = -1$ ,  $r = -5$

56)  $a_1 = 3$ ,  $r = -5$

57)  $a_1 = 1, r = -4$

58)  $a_1 = -2, r = 4$

**Given a term in a geometric sequence and the common ratio find the 8th term and the explicit formula.**

59)  $a_1 = -1, r = -3$

60)  $a_4 = -27, r = 3$

61)  $a_2 = 4, r = 2$

62)  $a_5 = -16, r = 2$

**Given two terms in a geometric sequence find the common ratio, the 8th term, and the explicit formula.**

63)  $a_6 = -12500$  and  $a_5 = -2500$

64)  $a_3 = 75$  and  $a_6 = -9375$

65)  $a_6 = 7776$  and  $a_2 = 6$

66)  $a_4 = 216$  and  $a_5 = -1296$

**Evaluate each geometric series described.**

67)  $-2 - 10 - 50 - 250\dots, n = 6$

68)  $-4 - 16 - 64 - 256\dots, n = 9$

69)  $-4 + 24 - 144 + 864\dots, n = 7$

70)  $-4 - 20 - 100 - 500\dots, n = 8$

71)  $\sum_{i=1}^8 4 \cdot 5^{i-1}$

72)  $\sum_{i=1}^7 (-2)^{i-1}$

73)  $\sum_{m=1}^7 3 \cdot 3^{m-1}$

74)  $\sum_{n=1}^7 4^{n-1}$

## Answers to 11.1-11.3: Sequences and Series Review (ID: 1)

- |  |   |  |                                |
|--|---|--|--------------------------------|
| 1) 12, 16, 20, 24  | 2) -4, -1, 2, 5   | 3) 23, 53, 83, 113   | 4) -30, -10, 10, 30            |
| 5) $a_n = \frac{2n}{2n+1}$   | 6) $a_n = n^2 + 3$  | 7) $a_n = (2n)^2$  | 8) $a_n = n^2 + 1$             |
| 9) Arithmetic  | 10) Arithmetic  | 11) Neither  | 12) Geometric                  |
| 13) Geometric  | 14) Neither   | 15) $\sum_{a=1}^6 a$   | 16) $\sum_{m=1}^5 \frac{1}{m}$ |
| 17) $\sum_{k=1}^4 4k$  | 18) $\sum_{n=1}^5 \frac{n}{n+1}$  | 19) 49   | 20) 45                         |
| 21) 1015   | 22) 45  | 23) Not arithmetic   |                                |
| 24) Common Difference: $d = -4$<br>$a_{52} = -226$<br>Explicit: $a_n = -18 - 4n$   | 25) Common Difference: $d = -6$<br>$a_{52} = -283$<br>Explicit: $a_n = 29 - 6n$       | 26) Not arithmetic   |                                |
| 27) $a_{52} = -471$<br>Explicit: $a_n = -3 - 9n$                                   | 28) $a_{52} = 321$<br>Explicit: $a_n = -43 + 7n$                                      | 29) $a_{52} = -279$<br>Explicit: $a_n = -19 - 5n$                        |                                |
| 30) $a_{52} = -121$<br>Explicit: $a_n = 35 - 3n$                                   | 31) $a_{52} = -502$<br>Explicit: $a_n = 18 - 10n$                                     | 32) $a_{52} = 10220$<br>Explicit: $a_n = -180 + 200n$                    |                                |
| 33) $a_{52} = -1024$<br>Explicit: $a_n = 16 - 20n$                                 | 34) $a_{52} = -233$<br>Explicit: $a_n = -25 - 4n$                                     | 35) $a_{52} = 136$<br>Explicit: $a_n = -20 + 3n$                         |                                |
| 36) $a_{52} = -5060$<br>Explicit: $a_n = 140 - 100n$                               | 37) $a_{52} = -5085$<br>Explicit: $a_n = 115 - 100n$                                  | 38) $a_{52} = -278$<br>Explicit: $a_n = 34 - 6n$                         |                                |
| 39) 153  | 40) 1036  | 41) 560  | 42) 480                        |
| 43) 552  | 44) -200  | 45) -952   | 46) -10170                     |
| 47) 485  | 48) 2640  | 49) -91  | 50) 1836                       |
| 51) Not geometric  | 52) Common Ratio: $r = -6$<br>$a_8 = 559872$<br>Explicit: $a_n = -2 \cdot (-6)^{n-1}$ | 53) Not geometric  |                                |
| 54) Common Ratio: $r = 5$<br>$a_8 = -312500$<br>Explicit: $a_n = -4 \cdot 5^{n-1}$ | 55) $a_8 = 78125$<br>Explicit: $a_n = -(-5)^{n-1}$                                    | 56) $a_8 = -234375$<br>Explicit: $a_n = 3 \cdot (-5)^{n-1}$              |                                |
| 57) $a_8 = -16384$<br>Explicit: $a_n = (-4)^{n-1}$                                 | 58) $a_8 = -32768$<br>Explicit: $a_n = -2 \cdot 4^{n-1}$                              | 59) $a_8 = 2187$<br>Explicit: $a_n = -(-3)^{n-1}$                        |                                |
| 60) $a_8 = -2187$<br>Explicit: $a_n = -3^{n-1}$                                    | 61) $a_8 = 256$<br>Explicit: $a_n = 2 \cdot 2^{n-1}$                                  | 62) $a_8 = -128$<br>Explicit: $a_n = -2^{n-1}$                           |                                |
| 63) Common Ratio: $r = 5$<br>$a_8 = -312500$<br>Explicit: $a_n = -4 \cdot 5^{n-1}$ | 64) Common Ratio: $r = -5$<br>$a_8 = -234375$<br>Explicit: $a_n = 3 \cdot (-5)^{n-1}$ | 65) Common Ratio: $r = 6$<br>$a_8 = 279936$<br>Explicit: $a_n = 6^{n-1}$ |                                |
| 66) Common Ratio: $r = -6$<br>$a_8 = 279936$<br>Explicit: $a_n = -(-6)^{n-1}$      | 67) -7812   | 68) -349524  |                                |
| 69) -159964  | 70) -390624   | 71) 390624   | 72) 43                         |

73) 3279

74) 5461