

Unit 8 Review

Date _____ Period _____

Write the explicit formula for each sequence.

1) $-2, -\frac{1}{2}, 1, \frac{5}{2}, 4, \dots$

2) $4, -20, 100, -500, 2500, \dots$

3) $\frac{1}{3}, \frac{4}{5}, \frac{9}{7}, \frac{16}{9}, \frac{25}{11}, \dots$

4) $-1, -2, -4, -8, -16, \dots$

Write the recursive formula for each sequence.

5) $2, 4, 12, 48, 240, \dots$

6) $-14, -6, -2, 0, 1, \dots$

7) $-\frac{5}{3}, -1, -\frac{1}{3}, \frac{1}{3}, 1, \dots$

8) $1, 3, 9, 27, 81, \dots$

Find the tenth term in each sequence.

9) $1, \frac{3}{4}, \frac{3}{5}, \frac{1}{2}, \frac{3}{7}, \dots$

10) $3, 12, 48, 192, 768, \dots$

11) $-1, -2, -6, -24, -120, \dots$

12) $-1, -2, -4, -8, -16, \dots$

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

13) $a_n = a_{n-1} \cdot 3$
 $a_1 = -1$

14) $a_n = a_{n-1} + 200$
 $a_1 = -15$

15) $a_n = na_{n-1}$
 $a_1 = 2$

16) $a_n = a_{n-1} \cdot -4$
 $a_1 = -1$

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

17) $-33, -43, -53, -63, \dots$

18) $25, 22, 19, 16, \dots$

19) 19, 29, 39, 49, ...

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

20) $-7, 23, -127, 623, \dots$

21) $4, 16, 64, 256, \dots$

Evaluate each arithmetic series described.

22) $33 + 42 + 51 + 60, \dots, n = 8$

23) $20 + 26 + 32 + 38, \dots, n = 8$

$$24) \sum_{m=1}^5 6m$$

$$25) \sum_{k=1}^5 (6k - 1)$$

Evaluate the related series of each sequence.

26) 10, 13, 16, 19, 22, 25, 28

27) 6, 3, 0, -3

Evaluate each geometric series described.

28) $4 - 8 + 16 - 32, \dots, n = 9$

29) $3 + 12 + 48 + 192, \dots, n = 9$

$$30) \sum_{n=1}^9 -2 \cdot 4^{n-1}$$

$$31) \sum_{m=1}^7 -4 \cdot (-3)^{m-1}$$

32) $a_1 = 2, a_n = 8192, r = 4$

33) $a_1 = 0.8, a_n = 62500, r = 5$

Evaluate each series.

$$34) \sum_{m=1}^7 m^2$$

$$35) \sum_{k=1}^5 k(k-1)$$

$$36) \sum_{a=1}^6 a$$

$$37) \sum_{a=1}^5 (3a^2 - 1)$$

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Date _____ Period _____

Write the explicit formula for each sequence.

1) $-2, -\frac{1}{2}, 1, \frac{5}{2}, 4, \dots$

$$a_n = -\frac{7}{2} + \frac{3}{2}n$$

3) $\frac{1}{3}, \frac{4}{5}, \frac{9}{7}, \frac{16}{9}, \frac{25}{11}, \dots$

$$a_n = \frac{n^2}{2n+1}$$

2) $4, -20, 100, -500, 2500, \dots$

$$a_n = 4 \cdot (-5)^{n-1}$$

4) $-1, -2, -4, -8, -16, \dots$

$$a_n = -2^{n-1}$$

Write the recursive formula for each sequence.

5) $2, 4, 12, 48, 240, \dots$ $a_n = na_{n-1}$
 $a_1 = 2$

6) $-14, -6, -2, 0, 1, \dots$ $a_n = \frac{2 + a_{n-1}}{2}$
 $a_1 = -14$

7) $-\frac{5}{3}, -1, -\frac{1}{3}, \frac{1}{3}, 1, \dots$ $a_n = a_{n-1} + \frac{2}{3}$
 $a_1 = -\frac{5}{3}$

8) $1, 3, 9, 27, 81, \dots$ $a_n = a_{n-1} \cdot 3$
 $a_1 = 1$

Find the tenth term in each sequence.

9) $1, \frac{3}{4}, \frac{3}{5}, \frac{1}{2}, \frac{3}{7}, \dots$

$$a_{10} = \frac{1}{4}$$

10) $3, 12, 48, 192, 768, \dots$

$$a_{10} = 786432$$

11) $-1, -2, -6, -24, -120, \dots$

$$a_{10} = -3628800$$

12) $-1, -2, -4, -8, -16, \dots$

$$a_{10} = -512$$

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

13) $a_n = a_{n-1} \cdot 3$
 $a_1 = -1$

Geometric

14) $a_n = a_{n-1} + 200$
 $a_1 = -15$

Arithmetic

15) $a_n = na_{n-1}$
 $a_1 = 2$

Neither

16) $a_n = a_{n-1} \cdot -4$
 $a_1 = -1$

Geometric

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

17) $-33, -43, -53, -63, \dots$ Common Difference: $d = -10$
 $a_{52} = -543$

Explicit: $a_n = -23 - 10n$

18) $25, 22, 19, 16, \dots$ Common Difference: $d = -3$
 $a_{52} = -128$

Explicit: $a_n = 28 - 3n$

19) 19, 29, 39, 49, ... Common Difference: $d = 10$

$$a_{52} = 529$$

$$\text{Explicit: } a_n = 9 + 10n$$

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

20) -7, 23, -127, 623, ...

Not geometric

21) 4, 16, 64, 256, ... Common Ratio: $r = 4$

$$a_8 = 65536$$

$$\text{Explicit: } a_n = 4 \cdot 4^{n-1}$$

Evaluate each arithmetic series described.

22) $33 + 42 + 51 + 60, \dots, n = 8$

$$516$$

23) $20 + 26 + 32 + 38, \dots, n = 8$

$$328$$

$$24) \sum_{m=1}^5 6m$$

$$90$$

$$25) \sum_{k=1}^5 (6k - 1)$$

$$85$$

Evaluate the related series of each sequence.

26) 10, 13, 16, 19, 22, 25, 28

$$133$$

27) 6, 3, 0, -3

$$6$$

Evaluate each geometric series described.

28) $4 - 8 + 16 - 32, \dots, n = 9$

$$684$$

29) $3 + 12 + 48 + 192, \dots, n = 9$

$$262143$$

$$30) \sum_{n=1}^9 -2 \cdot 4^{n-1}$$

$$-174762$$

$$31) \sum_{m=1}^7 -4 \cdot (-3)^{m-1}$$

$$-2188$$

32) $a_1 = 2, a_n = 8192, r = 4$

$$10922$$

33) $a_1 = 0.8, a_n = 62500, r = 5$

$$78124.8$$

Evaluate each series.

$$34) \sum_{m=1}^7 m^2$$

$$140$$

$$35) \sum_{k=1}^5 k(k-1)$$

$$40$$

$$36) \sum_{a=1}^6 a$$

$$21$$

$$37) \sum_{a=1}^5 (3a^2 - 1)$$

$$160$$