

Arithmetic & Geometric Sequences & Series Practice Date _____ Period _____

Determine if the sequence is arithmetic. If it is, find the common difference, the term named in the problem, the explicit formula, and the recursive formula.

1) $-9, -13, -17, -21, \dots$

Find a_{32}

2) $-9, -29, -49, -69, \dots$

Find a_{28}

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

Find a_{37}

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

Find a_{32}

5) $-\frac{8}{5}, -\frac{44}{15}, -\frac{64}{15}, -\frac{28}{5}, \dots$

Find a_{29}

Given two terms in an arithmetic sequence find the common difference, the term named in the problem, the explicit formula, and the recursive formula.

6) $a_{17} = -1595$ and $a_{31} = -2995$

Find a_{36}

7) $a_{17} = 15.4$ and $a_{34} = 25.6$

Find a_{37}

8) $a_{19} = \frac{57}{8}$ and $a_{34} = \frac{117}{8}$

Find a_{28}

Given a term in an arithmetic sequence and the common difference find the term named in the problem, the explicit formula, and the recursive formula.

9) $a_{13} = \frac{33}{7}, d = \frac{1}{2}$

Find a_{34}

10) $a_{22} = -637, d = -30$

Find a_{33}

11) $a_{35} = 321, d = 10$

Find a_{26}

Evaluate the related series of each sequence.

12) $-4.9, -4.1, -3.3, -2.5, -1.7$

13) $-2, 1, 4, 7$

Evaluate each arithmetic series described.

14) $\sum_{k=2}^7 (6k + 3)$

15) $\sum_{k=2}^{10} \left(-\frac{3}{2} + \frac{1}{2}k \right)$

16) $a_1 = -9, a_n = -405, n = 45$

17) $a_1 = 4, a_n = 40, n = 10$

18) $a_1 = 28, d = 8, n = 40$

19) $a_1 = 4, d = 2, n = 13$

Determine if the sequence is geometric. If it is, find the common ratio, the term named in the problem, the explicit formula, and the recursive formula.

20) $1, -\frac{1}{4}, \frac{1}{16}, -\frac{1}{64}, \dots$

Find a_9

21) $4, \frac{4}{3}, \frac{4}{9}, \frac{4}{27}, \dots$

Find a_{11}

22) $2, 6, 18, 54, \dots$

Find a_{11}

23) $5, \frac{5}{2}, \frac{5}{4}, \frac{5}{8}, \dots$

Find a_{12}

24) $1, 4, 16, 64, \dots$

Find a_{10}

Evaluate each geometric series described.

25) $\sum_{k=1}^9 \left(\frac{1}{4}\right)^{k-1}$

26) $\sum_{n=1}^9 4^{n-1}$

27) $a_1 = -2, r = -3, n = 7$

28) $a_1 = 1, r = \frac{3}{4}, n = 8$

Evaluate each infinite geometric series described.

29) $-5 - \frac{5}{3} - \frac{5}{9} - \frac{5}{27} \dots$

30) $\frac{1215}{32} + \frac{405}{16} + \frac{135}{8} + \frac{45}{4} \dots$

31) $\sum_{n=1}^{\infty} -27 \cdot \left(\frac{1}{3}\right)^{n-1}$

32) $\sum_{n=1}^{\infty} \frac{3}{2} \cdot \left(\frac{1}{5}\right)^{n-1}$

Find the missing term or terms in each arithmetic sequence.

33) $\dots, 14.7, \underline{\hspace{1cm}}, \underline{\hspace{1cm}}, \underline{\hspace{1cm}}, 14.3, \dots$

34) $\dots, 35, \underline{\hspace{1cm}}, \underline{\hspace{1cm}}, \underline{\hspace{1cm}}, -45, \dots$

Find the missing term or terms in each geometric sequence.

35) $\dots, 3, \underline{\hspace{1cm}}, \underline{\hspace{1cm}}, \underline{\hspace{1cm}}, 1875, \dots$

36) $\dots, 1.5, \underline{\hspace{1cm}}, \underline{\hspace{1cm}}, \underline{\hspace{1cm}}, 24, \dots$

Answers to Arithmetic & Geometric Sequences & Series Practice

- 1) Common Difference: $d = -4$
 $a_{32} = -133$
 Explicit: $a_n = -5 - 4n$
 Recursive: $a_n = a_{n-1} - 4$
 $a_1 = -9$
- 2) Common Difference: $d = -20$
 $a_{28} = -549$
 Explicit: $a_n = 11 - 20n$
 Recursive: $a_n = a_{n-1} - 20$
 $a_1 = -9$
- 3) Common Difference: $d = \frac{1}{2}$
 $a_{37} = 20$
 Explicit: $a_n = \frac{3}{2} + \frac{1}{2}n$
 Recursive: $a_n = a_{n-1} + \frac{1}{2}$
 $a_1 = 2$
- 4) Not arithmetic
- 5) Common Difference: $d = -\frac{4}{3}$
 $a_{29} = -\frac{584}{15}$
 Explicit: $a_n = -\frac{4}{15} - \frac{4}{3}n$
 Recursive: $a_n = a_{n-1} - \frac{4}{3}$
 $a_1 = -\frac{8}{5}$
- 6) Common Difference: $d = -100$
 $a_{36} = -3495$
 Explicit: $a_n = 105 - 100n$
 Recursive: $a_n = a_{n-1} - 100$
 $a_1 = 5$
- 7) Common Difference: $d = 0.6$
 $a_{37} = 27.4$
 Explicit: $a_n = 5.2 + 0.6n$
 Recursive: $a_n = a_{n-1} + 0.6$
 $a_1 = 5.8$
- 8) Common Difference: $d = \frac{1}{2}$
 $a_{28} = \frac{93}{8}$
 Explicit: $a_n = -\frac{19}{8} + \frac{1}{2}n$
 Recursive: $a_n = a_{n-1} + \frac{1}{2}$
 $a_1 = -\frac{15}{8}$
- 9) $a_{34} = \frac{213}{14}$
 Explicit: $a_n = -\frac{25}{14} + \frac{1}{2}n$
 Recursive: $a_n = a_{n-1} + \frac{1}{2}$
 $a_1 = -\frac{9}{7}$
- 10) $a_{33} = -967$
 Explicit: $a_n = 23 - 30n$
 Recursive: $a_n = a_{n-1} - 30$
 $a_1 = -7$
- 11) $a_{26} = 231$
 Explicit: $a_n = -29 + 10n$
 Recursive: $a_n = a_{n-1} + 10$
 $a_1 = -19$
- 12) -16.5
- 13) 10
- 14) 180
- 15) $\frac{27}{2}$
- 16) -9315
- 17) 220
- 18) 7360
- 19) 208

20) Common Ratio: $r = -\frac{1}{4}$

$$a_9 = \frac{1}{65536}$$

Explicit: $a_n = \left(-\frac{1}{4}\right)^{n-1}$

Recursive: $a_n = a_{n-1} \cdot -\frac{1}{4}$

$$a_1 = 1$$

23) Common Ratio: $r = \frac{1}{2}$

$$a_{12} = \frac{5}{2048}$$

Explicit: $a_n = 5 \cdot \left(\frac{1}{2}\right)^{n-1}$

Recursive: $a_n = a_{n-1} \cdot \frac{1}{2}$

$$a_1 = 5$$

26) 87381

27) -1094

30) $\frac{3645}{32}$

31) $-\frac{81}{2}$

34) 15, -5, -25

35) 15, 75, 375

21) Common Ratio: $r = \frac{1}{3}$

$$a_{11} = \frac{4}{59049}$$

Explicit: $a_n = 4 \cdot \left(\frac{1}{3}\right)^{n-1}$

Recursive: $a_n = a_{n-1} \cdot \frac{1}{3}$

$$a_1 = 4$$

24) Common Ratio: $r = 4$

$$a_{10} = 262144$$

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

Recursive: $a_n = a_{n-1} \cdot 4$

$$a_1 = 1$$

22) Common Ratio: $r = 3$

$$a_{11} = 118098$$

Explicit: $a_n = 2 \cdot 3^{n-1}$

Recursive: $a_n = a_{n-1} \cdot 3$

$$a_1 = 2$$

25) $\frac{87381}{65536}$

28) $\frac{58975}{16384}$

29) $-\frac{15}{2}$

32) $\frac{15}{8}$

33) 14.6, 14.5, 14.4

36) 3, 6, 12