

## 4.3 Arithmetic and Geometric Sequences Worksheet

Period \_\_\_\_\_

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**Determine if the sequence is arithmetic. If it is, find the common difference.**

1)  $-9, -109, -209, -309, \dots$

2)  $28, 18, 8, -2, \dots$

3)  $28, 26, 24, 22, \dots$

4)  $-16, -6, 4, 14, \dots$

5)  $-8, -4, 0, 4, \dots$

6)  $1, \frac{1}{2}, 0, -\frac{1}{2}, \dots$

**Find the common difference and the three terms in the sequence after the last one given.**

7)  $-39, -33, -27, -21, \dots$

8)  $-27, -17, -7, 3, \dots$

9)  $17, 13, 9, 5, \dots$

10)  $\frac{1}{5}, \frac{23}{15}, \frac{43}{15}, \frac{21}{5}, \dots$

**Find the common difference and the recursive formula.**

11)  $9, 19, 29, 39, \dots$

12)  $22, 19, 16, 13, \dots$

13)  $-3, 97, 197, 297, \dots$

14)  $34, 43, 52, 61, \dots$

**Find the common difference, the term named in the problem, and the explicit formula.**

15) 17, 11, 5, -1, ...  
Find  $a_{39}$

16) 5, -5, -15, -25, ...  
Find  $a_{20}$

17) -40, -47, -54, -61, ...  
Find  $a_{29}$

18) -32, -132, -232, -332, ...  
Find  $a_{40}$

19) -8, 22, 52, 82, ...  
Find  $a_{20}$

20) 29, 38, 47, 56, ...  
Find  $a_{29}$

21) 36, 29, 22, 15, ...  
Find  $a_{29}$

22) -20, -29, -38, -47, ...  
Find  $a_{20}$

**Determine if the sequence is geometric. If it is, find the common ratio.**

23) -2, -10, -50, -250, ...

24) -1, 6, -36, 216, ...

25) -1, -5, -25, -125, ...

26) -2, 10, -50, 250, ...

27) -3, -1,  $-\frac{1}{3}$ ,  $-\frac{1}{9}$ , ...

28) -2,  $\frac{1}{2}$ ,  $-\frac{1}{8}$ ,  $\frac{1}{32}$ , ...

**Find the common ratio and the three terms in the sequence after the last one given.**

29)  $-2, -8, -32, -128, \dots$

30)  $2, -8, 32, -128, \dots$

31)  $3, -6, 12, -24, \dots$

32)  $2, 10, 50, 250, \dots$

**Find the common ratio and the recursive formula.**

33)  $-1, 5, -25, 125, \dots$

34)  $-3, -15, -75, -375, \dots$

35)  $3, -15, 75, -375, \dots$

36)  $0.5, 1, 2, 4, \dots$

**Find the common ratio, the term named in the problem, and the explicit formula.**

37)  $4, 12, 36, 108, \dots$   
Find  $a_9$

38)  $-2, 6, -18, 54, \dots$   
Find  $a_{12}$

39)  $-3, 9, -27, 81, \dots$   
Find  $a_{10}$

40)  $-4, 8, -16, 32, \dots$   
Find  $a_{11}$

41)  $-4, -12, -36, -108, \dots$   
Find  $a_{12}$

42)  $4, 8, 16, 32, \dots$   
Find  $a_{10}$

43)  $-20, -10, -5, -\frac{5}{2}, \dots$

Find  $a_9$ 

44)  $\frac{1}{2}, \frac{1}{6}, \frac{1}{18}, \frac{1}{54}, \dots$

Find  $a_{12}$ 

**Given the first term and the common difference of an arithmetic sequence find the explicit formula and the three terms in the sequence after the last one given.**

45)  $a_1 = 35, d = -20$

46)  $a_1 = 22, d = -9$

47)  $a_1 = -34, d = -2$

48)  $a_1 = -22, d = -30$

**Given the first term and the common ratio of a geometric sequence find the explicit formula and the three terms in the sequence after the last one given.**

49)  $a_1 = 4, r = -4$

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

51)  $a_1 = 1, r = 3$

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

**Find the missing term or terms in each arithmetic sequence.**

53)  $\dots, -6, \underline{\quad}, 8, \dots$

54)  $\dots, 30, \underline{\quad}, \underline{\quad}, 0, \dots$

55)  $\dots, -14, \underline{\quad}, \underline{\quad}, 46, \dots$

56)  $\dots, 38, \underline{\quad}, \underline{\quad}, 65, \dots$

## 4.3 Arithmetic and Geometric Sequences Worksheet

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**Determine if the sequence is arithmetic. If it is, find the common difference.**

1)  $-9, -109, -209, -309, \dots$

$d = -100$

2)  $28, 18, 8, -2, \dots$

$d = -10$

3)  $28, 26, 24, 22, \dots$

$d = -2$

4)  $-16, -6, 4, 14, \dots$

$d = 10$

5)  $-8, -4, 0, 4, \dots$

$d = 4$

6)  $1, \frac{1}{2}, 0, -\frac{1}{2}, \dots$

$d = -\frac{1}{2}$

**Find the common difference and the three terms in the sequence after the last one given.**

7)  $-39, -33, -27, -21, \dots$

Common Difference:  $d = 6$

Next 3 terms:  $-15, -9, -3$

8)  $-27, -17, -7, 3, \dots$

Common Difference:  $d = 10$

Next 3 terms:  $13, 23, 33$

9)  $17, 13, 9, 5, \dots$

Common Difference:  $d = -4$

Next 3 terms:  $1, -3, -7$

10)  $\frac{1}{5}, \frac{23}{15}, \frac{43}{15}, \frac{21}{5}, \dots$

Common Difference:  $d = \frac{4}{3}$

Next 3 terms:  $\frac{83}{15}, \frac{103}{15}, \frac{41}{5}$

**Find the common difference and the recursive formula.**

11)  $9, 19, 29, 39, \dots$

Common Difference:  $d = 10$

Recursive:  $a_n = a_{n-1} + 10$

$a_1 = 9$

12)  $22, 19, 16, 13, \dots$

Common Difference:  $d = -3$

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

$a_1 = 22$

13)  $-3, 97, 197, 297, \dots$

Common Difference:  $d = 100$

Recursive:  $a_n = a_{n-1} + 100$

$a_1 = -3$

14)  $34, 43, 52, 61, \dots$

Common Difference:  $d = 9$

Recursive:  $a_n = a_{n-1} + 9$

$a_1 = 34$

**Find the common difference, the term named in the problem, and the explicit formula.**

15) 17, 11, 5, -1, ...

Find  $a_{39}$

Common Difference:  $d = -6$

$a_{39} = -211$

Explicit:  $a_n = 17 + (n - 1) \cdot -6$

16) 5, -5, -15, -25, ...

Find  $a_{20}$

Common Difference:  $d = -10$

$a_{20} = -185$

Explicit:  $a_n = 5 + (n - 1) \cdot -10$

17) -40, -47, -54, -61, ...

Find  $a_{29}$

Common Difference:  $d = -7$

$a_{29} = -236$

Explicit:  $a_n = -40 + (n - 1) \cdot -7$

18) -32, -132, -232, -332, ...

Find  $a_{40}$

Common Difference:  $d = -100$

$a_{40} = -3932$

Explicit:  $a_n = -32 + (n - 1) \cdot -100$

19) -8, 22, 52, 82, ...

Find  $a_{20}$

Common Difference:  $d = 30$

$a_{20} = 562$

Explicit:  $a_n = -8 + (n - 1) \cdot 30$

20) 29, 38, 47, 56, ...

Find  $a_{29}$

Common Difference:  $d = 9$

$a_{29} = 281$

Explicit:  $a_n = 29 + (n - 1) \cdot 9$

21) 36, 29, 22, 15, ...

Find  $a_{29}$

Common Difference:  $d = -7$

$a_{29} = -160$

Explicit:  $a_n = 36 + (n - 1) \cdot -7$

22) -20, -29, -38, -47, ...

Find  $a_{20}$

Common Difference:  $d = -9$

$a_{20} = -191$

Explicit:  $a_n = -20 + (n - 1) \cdot -9$

**Determine if the sequence is geometric. If it is, find the common ratio.**

23) -2, -10, -50, -250, ...

$r = 5$

24) -1, 6, -36, 216, ...

$r = -6$

25) -1, -5, -25, -125, ...

$r = 5$

26) -2, 10, -50, 250, ...

$r = -5$

27) -3, -1,  $-\frac{1}{3}$ ,  $-\frac{1}{9}$ , ...

$r = \frac{1}{3}$

28) -2,  $\frac{1}{2}$ ,  $-\frac{1}{8}$ ,  $\frac{1}{32}$ , ...

$r = -\frac{1}{4}$

**Find the common ratio and the three terms in the sequence after the last one given.**

29)  $-2, -8, -32, -128, \dots$

Common Ratio:  $r = 4$

Next 3 terms:  $-512, -2048, -8192$

30)  $2, -8, 32, -128, \dots$

Common Ratio:  $r = -4$

Next 3 terms:  $512, -2048, 8192$

31)  $3, -6, 12, -24, \dots$

Common Ratio:  $r = -2$

Next 3 terms:  $48, -96, 192$

32)  $2, 10, 50, 250, \dots$

Common Ratio:  $r = 5$

Next 3 terms:  $1250, 6250, 31250$

**Find the common ratio and the recursive formula.**

33)  $-1, 5, -25, 125, \dots$

Common Ratio:  $r = -5$

Recursive:  $a_n = a_{n-1} \cdot -5$

$a_1 = -1$

34)  $-3, -15, -75, -375, \dots$

Common Ratio:  $r = 5$

Recursive:  $a_n = a_{n-1} \cdot 5$

$a_1 = -3$

35)  $3, -15, 75, -375, \dots$

Common Ratio:  $r = -5$

Recursive:  $a_n = a_{n-1} \cdot -5$

$a_1 = 3$

36)  $0.5, 1, 2, 4, \dots$

Common Ratio:  $r = 2$

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

$a_1 = 0.5$

**Find the common ratio, the term named in the problem, and the explicit formula.**

37)  $4, 12, 36, 108, \dots$

Find  $a_9$

Common Ratio:  $r = 3$

$a_9 = 26244$

Explicit:  $a_n = 4 \cdot 3^{n-1}$

38)  $-2, 6, -18, 54, \dots$

Find  $a_{12}$

Common Ratio:  $r = -3$

$a_{12} = 354294$

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

39)  $-3, 9, -27, 81, \dots$

Find  $a_{10}$

Common Ratio:  $r = -3$

$a_{10} = 59049$

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

40)  $-4, 8, -16, 32, \dots$

Find  $a_{11}$

Common Ratio:  $r = -2$

$a_{11} = -4096$

Explicit:  $a_n = -4 \cdot (-2)^{n-1}$

41)  $-4, -12, -36, -108, \dots$

Find  $a_{12}$

Common Ratio:  $r = 3$

$a_{12} = -708588$

Explicit:  $a_n = -4 \cdot 3^{n-1}$

42)  $4, 8, 16, 32, \dots$

Find  $a_{10}$

Common Ratio:  $r = 2$

$a_{10} = 2048$

Explicit:  $a_n = 4 \cdot 2^{n-1}$

43)  $-20, -10, -5, -\frac{5}{2}, \dots$  Common Ratio:  $r = \frac{1}{2}$

Find  $a_9$

$$a_9 = -\frac{5}{64}$$

$$\text{Explicit: } a_n = -20 \cdot \left(\frac{1}{2}\right)^{n-1}$$

44)  $\frac{1}{2}, \frac{1}{6}, \frac{1}{18}, \frac{1}{54}, \dots$  Common Ratio:  $r = \frac{1}{3}$

Find  $a_{12}$

$$a_{12} = \frac{1}{354294}$$

$$\text{Explicit: } a_n = \frac{1}{2} \cdot \left(\frac{1}{3}\right)^{n-1}$$

**Given the first term and the common difference of an arithmetic sequence find the explicit formula and the three terms in the sequence after the last one given.**

45)  $a_1 = 35, d = -20$

Next 3 terms: 15, -5, -25

$$\text{Explicit: } a_n = 35 + (n-1) \cdot -20$$

46)  $a_1 = 22, d = -9$

Next 3 terms: 13, 4, -5

$$\text{Explicit: } a_n = 22 + (n-1) \cdot -9$$

47)  $a_1 = -34, d = -2$

Next 3 terms: -36, -38, -40

$$\text{Explicit: } a_n = -34 + (n-1) \cdot -2$$

48)  $a_1 = -22, d = -30$

Next 3 terms: -52, -82, -112

$$\text{Explicit: } a_n = -22 + (n-1) \cdot -30$$

**Given the first term and the common ratio of a geometric sequence find the explicit formula and the three terms in the sequence after the last one given.**

49)  $a_1 = 4, r = -4$

Next 3 terms: -16, 64, -256

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

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

Next 3 terms: -8, -32, -128

$$\text{Explicit: } a_n = -2 \cdot 4^{n-1}$$

51)  $a_1 = 1, r = 3$

Next 3 terms: 3, 9, 27

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

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

Next 3 terms: 15, -75, 375

$$\text{Explicit: } a_n = -3 \cdot (-5)^{n-1}$$

**Find the missing term or terms in each arithmetic sequence.**

53)  $\dots, -6, \underline{\quad}, 8, \dots$

1

54)  $\dots, 30, \underline{\quad}, \underline{\quad}, 0, \dots$

20, 10

55)  $\dots, -14, \underline{\quad}, \underline{\quad}, 46, \dots$

6, 26

56)  $\dots, 38, \underline{\quad}, \underline{\quad}, 65, \dots$

47, 56