

Name:

Date:

WORKSHEET :



Arithmetic Sequences

Arithmetic Sequence $A_n = A_1 + d(n - 1)$

Identify the common difference, d .

1) 1, 4, 7, ...

2) 8, 6, 4, ...

3) 17, 21, 25, 29, ...

4) 1, 3, 6, 10, ...

Arithmetic Sequence $A_n = A_1 + d(n - 1)$

Find the n th term in the sequence, A_n .

5) 1, 2, 3, 4, ... $A_{57} = ?$

6) -5, -2, 1, ... $A_{15} = ?$

7) 10, 5, 0, ... $A_{21} = ?$

7) 15, 13, 11, ... $A_{15} = ?$

8) 6, 13, 20, ... $A_{12} = ?$

9) 5, 2, -1, ... $A_{15} = ?$

Arithmetic Sequence $A_n = A_1 + d(n - 1)$

Find the number of terms, n

10) 8, 10, 12, ... 96, 98

11) -1, 0, 1, 2, ... 37, 38

12) 5, 10, 15, ... 200, 205

13) -1, -4, -7, ... -31, -34

14) 8, 4, 0, ... -24, -28

15) 2, 4, 6, 8, ... 22, 24

WORKSHEET :



Geometric Sequences

Geometric Sequence $A_n = A_1 \times r^{(n-1)}$

Identify the common multiplier, r .

1) 1, 2, 4, ...

2) 8, 4, 2, ...

3) $-1/3, 1, -3, 9, \dots$

4) $1, 1/2, 1/4, \dots$

5) 1, -2, 4, -8, ...

6) 625, 25, 5, ...

Geometric Sequence $A_n = A_1 \times r^{(n-1)}$

Find the n th term in the sequence, A_n .

7) 1, 2, 4, ... $A_{10} = ?$

8) 8, 4, 2, ... $A_{11} = ?$

9) $-1/3, 1, -3, 9, \dots$ $A_7 = ?$

10) $1, 1/2, 1/4, \dots$ $A_{11} = ?$

11) 1, -2, 4, -8, ... $A_9 = ?$

12) 625, 25, 5, ... $A_7 = ?$

Geometric Sequence $A_n = A_1 \times r^{(n-1)}$

Find the number of terms, n .

13) 1, 2, 4, ... 512, 1024

14) $1/27, 1/9, 1/3, \dots, 27, 81$

ANSWERS :



Arithmetic Sequences

Arithmetic Sequence $A_n = A_1 + d(n - 1)$

Identify the common difference, d .

1) 1, 4, 7, ... $d = +3$

2) 8, 6, 4, ... $d = -2$

3) 17, 21, 25, 29.... $d = +4$

4) 1, 3, 6, 10, The sequence is not arithmetic. i.e. there is no common difference.

Arithmetic Sequence $A_n = A_1 + d(n - 1)$

Find the n th term in the sequence, A_n .

5) 1, 2, 3, 4... $A_{57} = 1 + 1(57 - 1) = 1 + 56 = 57$

6) -5, -2, 1, ... $A_{15} = -5 + 3(15 - 1) = -5 + 42 = 37$

7) 10, 5, 0, ... $A_{21} = 10 - 5(21 - 1) = 10 - 100 = -90$

7) 15, 13, 11, ... $A_{15} = 15 - 2(15 - 1) = 15 - 2(14) = -13$

8) 6, 13, 20,... $A_{12} = 6 + 7(12 - 1) = 6 + 7(11) = 83$

9) 5, 2, -1, ... $A_{15} = 5 - 3(15 - 1) = 5 - 3(14) = -37$

Arithmetic Sequence $A_n = A_1 + d(n - 1)$

Find the number of terms, n

10) 8, 10, 12,...96, 98
 $98 = 8 + 2(n - 1) = 8 + 2n - 2$
 $2n = 98 - 8 + 2 = 92$
 $n = 92/2 = 46$ terms

11) -1, 0, 1, 2, ...37, 38
 $38 = -1 + 1(n - 1) = -1 + n - 1$
 $n = 38 + 1 + 1 = 40$ terms

12) 5, 10, 15,...200, 205
 $205 = 5 + 5(n - 1) = 5 + 5n - 5$
 $5n = 205$
 $n = 205/5 = 41$ terms

13) -1, -4, -7...-31, -34
 $-34 = -1 - 3(n - 1) = -1 - 3n + 3$
 $-3n = -34 + 1 - 3 = -36$
 $n = -36/-3 = 12$ terms

14) 8, 4, 0,...-24, -28
 $-28 = 8 - 4(n - 1) = 8 - 4n + 4$
 $-4n = -28 - 8 - 4 = -40$
 $n = -40/-4 = 10$ terms

15) 2, 4, 6, 8, ...22, 24
 $24 = 2 + 2(n - 1) = 2 + 2n - 2$
 $2n = 24$
 $n = 24/2 = 12$ terms

ANSWERS :



Geometric Sequences

Geometric Sequence $A_n = A_1 \times r^{(n-1)}$

Identify the common multiplier, r .

1) $1, 2, 4, \dots$ $r = 2$

2) $8, 4, 2, \dots$ $r = 1/2$

3) $-1/3, 1, -3, 9, \dots$ $r = -3$

4) $1, 1/2, 1/4, \dots$ $r = 1/2$

5) $1, -2, 4, -8, \dots$ $r = -2$

6) $625, 25, 5, \dots$ $r = 1/5$

Geometric Sequence $A_n = A_1 \times r^{(n-1)}$

Find the n th term in the sequence, A_n .

7) $1, 2, 4, \dots$ $A_{10} = 1 \times 2^{10-1} = 2^9 = 512$

8) $8, 4, 2, \dots$ $A_{11} = 8 \times (1/2)^{11-1} = 8/2^{10} = 2^3/2^{10} = 2^{-7} = 1/128$

9) $-1/3, 1, -3, 9, \dots$ $A_7 = -1/3 \times (-3)^{7-1} = (-3)^{-1} \times (-3)^6 = (-3)^5 = -243$

10) $1, 1/2, 1/4, \dots$ $A_{11} = 1 \times (1/2)^{11-1} = 1/2^{10} = 1,024$

11) $1, -2, 4, -8, \dots$ $A_9 = 1 \times (-2)^{9-1} = (-2)^8 = -256$

12) $625, 25, 5, \dots$ $A_7 = 625 \times (1/5)^{7-1} = 5^3 \times 1/5^6 = 5^{3-6} = 5^{-3} = 1/625$

Geometric Sequence $A_n = A_1 \times r^{(n-1)}$

Find the number of terms, n .

13) $1, 2, 4, \dots, 512, 1024$
 $1,024 = 1 \times 2^{n-1} = 1 \times 2^n/2^1$
 $2,048 = 1 \times 2^n$
 $2,048 = 1 \times 2^{11}$
 $n = 11$

14) $1/27, 1/9, 1/3, \dots, 27, 81$
 $81 = 1/27 \times 3^{n-1} = 3^{-3} \times 3^n/3^1$
 $81 \times 3 = 3^{-3} \times 3^n$
 $243 \times 3^3 = 3^n$
 $3^5 \times 3^3 = 3^n$
 $3^8 = 3^n$
 $n = 8$

KEY CONCEPTS:

A sequence is a set of numbers where every term is defined by some rule. Two basic rules of sequences are addition and multiplication where each term adds a common amount or multiplies a common amount to the previous term.

1. Arithmetic Sequence -

$$A_n = A_1 + d(n - 1)$$

A_n = n th term in the sequence

A_1 = 1st term in the sequence

d = common difference (amount added to each term)

n = number of terms in the sequence

The sequence rule above typically permits the calculation of the n th term in an arithmetic sequence. It can also be used to calculate A_1 , d , or n depending on the information provided.

2. Geometric Sequence -

$$A_n = A_1 \times r^{(n - 1)}$$

A_n = n th term in the sequence

A_1 = 1st term in the sequence

r = common multiplier (amount multiplied to each term)

n = number of terms in the sequence

The sequence rule above typically permits the calculation of the n th term in a geometric sequence. It can also be used to calculate A_1 , r , or n depending on the information provided.