

## Sequences &amp; Series Practice

Determine if the sequence is arithmetic, geometric, or neither. Then find the recursive and explicit equation. Then find the 10th term.

1) 28, 19, 10, 1, ...

Common Difference:  $d = -9$

Explicit:  $a_n = 37 - 9n$

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

$a_1 = 28$

2) -2, -8, -32, -128, ...

Common Ratio:  $r = 4$

$a_8 = -32768$

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

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

$a_1 = -2$

3) 3, 5, 8, 12, 17, ...

$a_n = a_{n-1} + n$

$a_1 = 3$

4) -15, -8, -1, 6, ...

Common Difference:  $d = 7$

$a_{52} = 342$

Explicit:  $a_n = -22 + 7n$

Find the missing term or terms in each arithmetic sequence.

5) ..., 5, \_\_\_\_, \_\_\_\_, \_\_\_\_, -795, ...

-195, -395, -595

Find the missing term or terms in each geometric sequence.

6) ..., 1, \_\_\_\_, \_\_\_\_, \_\_\_\_, 256, ...

4, 16, 64

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

7)  $a_1 = -21$ ,  $d = 4$

$a_{52} = 183$

Explicit:  $a_n = -25 + 4n$

8)  $a_1 = 36$ ,  $d = -200$

$a_{52} = -10164$

Explicit:  $a_n = 236 - 200n$

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

9)  $a_1 = 1, r = -2$

$a_8 = -128$

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

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

$a_8 = 234375$

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

Evaluate the related series of each sequence. Use your formulas!

11)  $-19, -29, -39, -49, -59, -69, -79$

$-343$

12)  $4 + 16 + 64 + 256\dots, n = 8$

$87380$

Evaluate each arithmetic series described.

13)  $a_1 = 7, d = 5, n = 15$

$630$

14)  $a_1 = 9, d = 6, n = 45$

$6345$

15)  $\sum_{i=4}^{33} (2i - 1)$

$1080$

16)  $\sum_{m=1}^9 3 \cdot 2^{m-1}$

$1533$

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

$45$

18)  $\sum_{k=1}^6 k(k+1)$

$112$

Write the following in sigma notation.

19)  $9, 15, 21, 27, 33, 39$

~~144~~  
 $\sum_{n=1}^6 (6n+3)$

20)  $-2 - 8 - 32 - 128\dots, n = 9$

~~-174762~~  
 $\sum_{n=1}^9 -2(4)^{n-1}$