

## Arithmetic Sequence and Series

$$t_n = t_1 + d(n - 1)$$

$$S_n = n \cdot \left( \frac{t_1 + t_n}{2} \right)$$

## Geometric Sequence and Series

$$t_n = t_1 \cdot (r)^{n-1}$$

$$S_n = t_1 \cdot \left( \frac{1 - r^n}{1 - r} \right)$$

$$S = \frac{t_1}{1 - r}$$

**Answers!**

**DIRECTIONS:** Identify each sequence as **arithmetic**, **geometric**, or **neither** (write the entire word in the provided blank).

1. 10, 15, 20, 25, 30

**arithmetic**

2. 5, 15, 45, 135, 405

**geometric**

3. 10, 13, 19, 28, 40

**neither**

**DIRECTIONS:** Write the **first four terms** of the given sequences in the provided blanks.

4.  $t_n = 5n - 3$

**2, 7, 12, 17**

5.  $t_n = 3^n$

**3, 9, 27, 81**

**DIRECTIONS:** Find the **formula** for the  $n$ th term of each arithmetic sequence.

6. 16, 13, 10, 7, ...

 **$t_n = -3n + 19$** 

7.  $-7, -2, 3, 8, \dots$

 **$t_n = 5n - 12$**

DIRECTIONS: Find the **formula** for the  $n$ th term of each geometric sequence.

8. 162, 54, 18, 6, ...

$$t_n = 162\left(\frac{1}{3}\right)^{n-1}$$

9. 2, 10, 50, 250, ...

$$t_n = 2(5)^{n-1}$$

DIRECTIONS: Find the **specified term** of the arithmetic or geometric sequence.

10. 11, 20, 29, 38, ...,  $t_{41}$

$$371$$

11. 3, 12, 48, 192, ...,  $t_9$

$$196,608$$

DIRECTIONS: Solve and show work.

12. If your first movie was 19 minutes in length, and then each successive movie increased in length by 12 minutes, what will be the length of your fourteenth movie?

$$175 \text{ minutes (or 2 hours 55 minutes)}$$

DIRECTIONS: Write each series using **sigma** ( $\sum$ ) notation.

13.  $-8 + (-2) + 4 + \dots + 76$

$$\sum_{n=1}^{15} (6n - 14)$$

14.  $1 + 8 + 27 + 64 + \dots + 1000$

$$\sum_{n=1}^{10} n^3$$

DIRECTIONS: Find the **sum** of each arithmetic series. Show work.

15.  $\sum_{n=1}^{12} (4n + 3)$

**348**

16.  $t_1 = 11, t_{10} = 92, n = 150$

**102,225**

DIRECTIONS: Find the **sum** of each geometric series. Show work.

17.  $t_1 = 3, r = 2, n = 5$

**93**

18.  $t_1 = -2, r = -3, n = 9$

**-9842**

DIRECTIONS: Find the **sum** of each infinite geometric series. If the series has a sum, show work; if the series has no sum, write "no sum" in the blank.

19.  $80 + 20 + 5 + \dots$

 **$106\frac{2}{3}$  or  $\frac{320}{3}$  or  $106.\bar{6}$** 

20.  $7 + 14 + 28 + 56 + \dots$

**no sum**

DIRECTIONS: Solve and show work.

21. On Sunday, Ellery made 5 free throws. She shot free throws every day of the week and always doubled the number she made the previous day. When she finished on Saturday, how many free throws had she made for the week?

**635 free throws**