

AP Precalculus - M3Y & M3Z

Arithmetic & Geometric Sequences - Homework 1

1. Let a_n , $n \in \mathbb{N}^*$, be an arithmetic sequence. Find the general term of a_n if:

(i) $a_1 = 9$ and $d = 3$

(iii) $a_1 = 6$ and $d = -3$

(ii) $a_1 = -10$ and $d = 5$

(iv) $a_1 = -8$ and $d = -\frac{4}{5}$

2. Let b_n , $n \in \mathbb{N}^*$, be a geometric sequence. Find the general term of b_n if:

(i) $b_1 = 1$ and $r = 2$

(iii) $b_1 = 3$ and $r = -\frac{1}{2}$

(ii) $b_1 = -\frac{1}{8}$ and $r = 4$

(iv) $b_1 = -5$ and $r = -3$

3. Evaluate the following sums:

(i) $2 + 5 + 8 + 11 + \dots + 899$

(iii) $1 + \frac{1}{2} + 0 - \frac{1}{2} - \dots - 49$

(ii) $1 + 2 + 4 + 8 + \dots + 2048$

(iv) $12 - 4 + \frac{4}{3} - \frac{4}{9} + \dots - \frac{4}{6,561}$

4. Let a_n , $n \in \mathbb{N}^*$, be an arithmetic sequence. If $a_5 = 12$ and $a_{17} = 48$, find a_{2024} .

5. Let b_n , $n \in \mathbb{N}^*$, be a geometric sequence. If $b_3 = \frac{5}{2}$ and $b_9 = \frac{5}{128}$, find b_{15} .

6. Let a_n , $n \in \mathbb{N}^*$, be an arithmetic sequence with $a_{10} = 10$ and $S_{20} = 230$. Find the general term of a_n .

7. Let a_n , $n \in \mathbb{N}^*$, be an arithmetic sequence with $a_1 = 5$ and $a_5 = 13$.

Find the sum $a_{100} + a_{101} + a_{102} + \dots + a_{2025}$.