How to find the nth term of an arithmetic sequence?

An arithmetic progression is a sequence where the differences between every two consecutive terms are the same.

Answer: The expression to calculate the nth term of an arithmetic sequence is a$_n$ = a + (n - 1) d.

Let's look into the stepwise solution

Explanation:

For a given arithmetic sequence, the nth term of AP is calculated using the following expression:

a$_n$ = a + (n - 1) d

Where,

- 'a' is the first term of the AP
- 'd' is the common difference
- 'n' is the number of terms
- 'a$_n$' is the nth term of the AP

Let's take an example to understand this.

Example: Find the 25th term of the given arithmetic sequence 3, 9, 15, 21, 27, …

Solution:

a = 3, d = 6, n = 25

Thus, substituting these values in the formula

a$_n$ = a + (n - 1) d

⇒ a$_{25}$ = 3 + (25 - 1) 6

⇒ a$_{25}$ = 3 + 24 × 6

⇒ a$_{25}$ = 3 + 144

⇒ a$_{25}$ = 147

Thus. the 25th term of the given sequence is 144.

We can use Cuemath's Online Arithmetic sequence calculator to find the arithmetic sequence using the first term and the common difference between the terms.

Hence, the expression to calculate the nth term of AP if given by $a_n = a + (n - 1)\ d$.