

Ch-5 Arithmetic Progressions

1. A group of numbers connected by a definite law is known as sequence.
2. **Arithmetic Progression** – A Sequence in which each term is obtained from the preceding term by adding a constant quantity to it.
3. A sequence is called a series if its terms are connected by the sign of addition or subtraction.
4. n^{th} term of an Arithmetic Progression, $a_n = a + (n - 1) d$, where, a is first term, d is the common difference, and l is the last term.
5. **Selection of terms of an A.P –**
 - a. When odd number of terms are required. Take middle term as ‘ a ’ and common difference as ‘ d ’.
 - b. When even number of terms are required take $a - d$, $a + d$ as two middle terms and ‘ $2d$ ’ as common difference.
6. The condition for three terms to be in an Arithmetic Progression is that common difference between them must be same, i.e., $t_3 - t_2 = t_2 - t_1$.
7. Sum of n terms of an A.P., $S_n = \frac{n}{2} [2a + (n - 1) d] = \frac{n}{2} [a + l]$

Where, l is the last term,
 a is the first term, and
 d is the common difference.
8. n^{th} term from the end is $l - (n - 1)d$, where, l is the last term, and d is the common difference.
9. The Standard form of an Arithmetic Progression is $- a + (a + d) + (a + 2d) + \dots (l - d) + l$

Here, a is the first term,
 l is the last term, and
 d is the common difference.
10. n^{th} term of an Arithmetic Progression is the difference of the sum to first n terms and the sum to first $(n - 1)$ terms – $a_n = S_n - S_{n-1}$.