Class 10 Mathematics – Chapter: Arithmetic Progressions (AP)

---

1. Introduction

An Arithmetic Progression (AP) is a sequence of numbers in which the difference between consecutive terms is constant.

---

2. General Form of an AP

If aaa is the first term and ddd is the common difference, then the nthn^{th}nth term is:

an=a+(n−1)da_n = a + (n - 1)dan=a+(n−1)d

---

3. Common Difference

d=a2−a1=a3−a2=…d = a_2 - a_1 = a_3 - a_2 = \dotsd=a2−a1=a3−a2=…

---

4. Sum of First n Terms

The sum SnS_nSn of the first nnn terms of an AP is:

Sn=n2[2a+(n−1)d]S_n = \frac{n}{2}[2a + (n - 1)d]Sn=2n[2a+(n−1)d]

or

Sn=n2(a+l)S_n = \frac{n}{2} (a + l)Sn=2n(a+l)

where lll is the nthn^{th}nth (last) term.

---

5. Important Points

- If $d > 0$, AP is increasing.
- If $d < 0$, AP is decreasing.
- If $d = 0$, all terms are equal.

---

6. Applications and Word Problems

AP problems include sequences like number of seats, payments, arrangement of objects, etc. Practice forming the sequence and applying formulas.

---

7. Important Exam Tips

-

Always identify aaa, ddd, and nnn clearly.

- Use correct formula based on information given.
- Practice both finding terms and sum problems.
- Check units and arithmetic carefully.