



Class 9 Maths – Chapter 8



Exercise 8.2 – Arithmetic Progressions

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The textbook's Exercise Set 8.2 contains 4 questions.

1. Find the 10th and 26th Terms

Question: Find the 10th and 26th terms of the AP:

3, 8, 13, 18, ...



Solution:

First term:

$$a = 3$$

Common difference:

$$d = 8 - 3 = 5$$

Formula:

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

10th term:

$$t_{10} = 3 + (10 - 1)5$$

$$= 3 + 45$$

$$= 48$$

26th term:

$$t_{26} = 3 + (26 - 1)5$$

$$= 3 + 125$$

$$= 128$$

✓ **Answer:**

$$\text{10th term} = 48$$

$$\text{26th term} = 128$$

2. 🔍 Find the Term of an AP

Question: Which term of the AP

21, 18, 15, ...

is -81?

Also, is 0 a term of this AP? Give reasons.

✏ **Solution:**

First term:

$$a = 21$$

Common difference:

$$d = 18 - 21 = -3$$

Formula:

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

So:

$$t_n = 21 + (n - 1)(-3)$$

(i) Which term is -81?

Put:

$$21 - 3(n - 1) = -81$$

$$21 - 3n + 3 = -81$$

$$24 - 3n = -81$$

$$-3n = -105$$

$$n = 35$$

✓ **Answer:**

-81 is the 35th term.

(ii) Is 0 a term?

Put:

$$21 - 3(n - 1) = 0$$

$$24 - 3n = 0$$

$$3n = 24$$

$$n = 8$$

Since 8 is a natural number:

✓ **Answer:**

Yes, 0 is the 8th term.

3. Find the nth Term and Recursive Rule

Question: Find the nth term of the AP:

11, 8, 5, 2, ...

Also write its recursive rule.

 **Solution:**

First term:

$$a = 11$$

Common difference:

$$d = 8 - 11 = -3$$

Using:

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

$$t_n = 11 + (n - 1)(-3)$$

$$= 11 - 3n + 3$$

$$= 14 - 3n$$

✓ nth term:

$$t_n = 14 - 3n$$

↻ Recursive rule:

First term:

$$t_1 = 11$$

Each term is 3 less than the previous term:

$$t_n = t_{n-1} - 3$$

✓ Answer:

Explicit rule: $t_n = 14 - 3n$

Recursive rule: $t_1 = 11, t_n = t_{n-1} - 3$

The textbook specifically asks for both forms for this AP.

4. ★ AP with 50 Terms

Question: An AP consists of **50 terms**. The 3rd term is **12** and the last term is **106**. Find the 29th term.

 Solution:

Let:

First term = a

Common difference = d

Given 3rd term:

$$\mathbf{a + 2d = 12 \dots (1)}$$

Since there are 50 terms, the last term is the 50th term:

$$\mathbf{a + 49d = 106 \dots (2)}$$

Subtract (1) from (2):

$$(a + 49d) - (a + 2d) = 106 - 12$$

$$47d = 94$$

$$\mathbf{d = 2}$$

Substitute into (1):

$$a + 2(2) = 12$$

$$a + 4 = 12$$

$$\mathbf{a = 8}$$

Now find the 29th term:

$$t_{29} = a + (29 - 1)d$$

$$= 8 + 28(2)$$

$$= 8 + 56$$

$$\mathbf{= 64}$$

 Answer:

29th term = 64

The textbook itself gives the equations **a + 2d = 12** and **a + 49d = 106** as the intended starting point.



COMPLETE ANSWER KEY

Q. **Answer**

1 10th = **48**, 26th = **128**

2 -81 = **35th term**; 0 = **8th term**

3 $t_n = 14 - 3n$; recursive: $t_1 = 11$, $t_n = t_{n-1} - 3$

4 29th term = **64**

★ Must Remember

📌 nth term of AP:

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

📌 Recursive rule of AP:

$$t_1 = a$$

$$t_n = t_{n-1} + d$$

📌 To check whether a number belongs to an AP, put the number equal to t_n and check whether **n is a natural number**.

📌 For the **last term of an AP with 50 terms**, use $t_{50} = a + 49d$.