



Class 9 Maths – Chapter 8



Exercise 8.1 – Sequences

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Exercise 8.1 has **6 questions** covering explicit rules, recursive rules and the Virahāṅka–Fibonacci-type recurrence.

1. Find the First Five Terms

(i) $t_n = 3n - 4$

Put $n = 1, 2, 3, 4, 5$:

$$t_1 = 3(1) - 4 = -1$$

$$t_2 = 3(2) - 4 = 2$$

$$t_3 = 3(3) - 4 = 5$$

$$t_4 = 3(4) - 4 = 8$$

$$t_5 = 3(5) - 4 = 11$$



Answer:

-1, 2, 5, 8, 11

(ii) $t_n = 2 - 5n$

$$t_1 = 2 - 5 = -3$$

$$t_2 = 2 - 10 = -8$$

$$t_3 = 2 - 15 = -13$$

$$t_4 = 2 - 20 = -18$$

$$t_5 = 2 - 25 = -23$$



Answer:

-3, -8, -13, -18, -23

(iii) $t_n = n^2 - 2n + 3$

$$t_1 = 1^2 - 2(1) + 3 = 2$$

$$t_2 = 2^2 - 2(2) + 3 = 3$$

$$t_3 = 3^2 - 2(3) + 3 = 6$$

$$t_4 = 4^2 - 2(4) + 3 = 11$$

$$t_5 = 5^2 - 2(5) + 3 = 18$$

 **Answer:**

2, 3, 6, 11, 18

2. Find the 10th and 15th Terms

Given:

$$t_n = 5n - 3$$

10th term:

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

$$= 50 - 3$$

$$= 47$$

15th term:

$$t_{15} = 5(15) - 3$$

$$= 75 - 3$$

$$= 72$$

 **Answer:**

$$t_{10} = 47$$

$$t_{15} = 72$$

3. Check Whether 97 and 172 Are Terms

Given:

$$t_n = 5n - 3$$

(i) Is 97 a term?

Put:

$$5n - 3 = 97$$

$$5n = 100$$

$$n = 20$$

Since 20 is a natural number:

 **97 is the 20th term.**

(ii) Is 172 a term?

$$5n - 3 = 172$$

$$5n = 175$$

$$n = 35$$

Since 35 is a natural number:

 **172 is the 35th term.**

4. Which Term Is 607?

Given:

$$t_n = 5n - 3$$

Put:

$$5n - 3 = 607$$

$$5n = 610$$

$$n = 122$$

✓ **Answer:**

607 is the 122nd term.

5. Recursive Sequence

Given:

$$t_1 = -5$$

and

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



Find the first five terms:

$$t_1 = -5$$

$$t_2 = -5 + 3 = -2$$

$$t_3 = -2 + 3 = 1$$

$$t_4 = 1 + 3 = 4$$

$$t_5 = 4 + 3 = 7$$



First five terms:

-5, -2, 1, 4, 7



Is 52 a term?

The sequence increases by 3.

We can write:

$$t_n = -5 + (n - 1)3$$

$$= -5 + 3n - 3$$

$$= 3n - 8$$

Put $t_n = 52$:

$$3n - 8 = 52$$

$$3n = 60$$

$$n = 20$$

✓ **Answer:**

Yes, 52 is the 20th term.

6. ★ Recursive Sequence

Given:

$$T_1 = 1$$

$$T_2 = 2$$

$$T_3 = 4$$

and

$$T_n = T_{n-1} + T_{n-2} + T_{n-3}, \text{ for } n \geq 4.$$

 **Find T_4 :**

$$T_4 = T_3 + T_2 + T_1$$

$$= 4 + 2 + 1$$

$$= 7$$

Find T_5 :

$$T_5 = T_4 + T_3 + T_2$$

$$= 7 + 4 + 2$$

$$= 13$$

Find T_6 :

$$T_6 = T_5 + T_4 + T_3$$

$$= 13 + 7 + 4$$

$$= 24$$

Find T_7 :

$$T_7 = T_6 + T_5 + T_4$$

$$= 24 + 13 + 7$$

$$= 44$$

Find T_8 :

$$T_8 = T_7 + T_6 + T_5$$

$$= 44 + 24 + 13$$

$$= 81$$

 **Answer:**

$$T_4 = 7$$

$$T_5 = 13$$

$$T_6 = 24$$

$$T_7 = 44$$

$$T_8 = 81$$



COMPLETE ANSWER KEY

Q.	Answer
1(i)	-1, 2, 5, 8, 11
1(ii)	-3, -8, -13, -18, -23
1(iii)	2, 3, 6, 11, 18
2	$t_{10} = 47$, $t_{15} = 72$
3(i)	97 is the 20th term
3(ii)	172 is the 35th term
4	607 is the 122nd term
5	-5, -2, 1, 4, 7; 52 is the 20th term
6	$T_4 = 7$, $T_5 = 13$, $T_6 = 24$, $T_7 = 44$, $T_8 = 81$

★ Must Remember

- ◆ **Explicit rule:** Directly gives the n th term, e.g. $t_n = 5n - 3$.
- ◆ **Recursive rule:** Defines a term using earlier terms.
- ◆ To check whether a number is a term, **put that number equal to t_n and solve for n .**
- ◆ If **n is a natural number**, the number is a term of the sequence.

The textbook's Exercise 8.1 contains exactly these six questions.