

Class : IXTH

Date :

Subject : MATHS

DPP No. : 2

PREDICTING WHAT COMES NEXT: EXPLORING SEQUENCES AND PROGRESSIONS

Multiple Choice Questions

- Which of the following sequences is not an AP?
(i) $3, 3 + \sqrt{2}, 3 + 2\sqrt{2}, 3 + 3\sqrt{2}, \dots$
(ii) $-2, -4, -6, -10, \dots$
(iii) $\sqrt{8}, \sqrt{18}, \sqrt{32}, \dots$
(a) (i) only
(b) (iii) only
(c) (ii) only
(d) (i), (ii) and (iii)
- The common difference of the AP whose n^{th} term is given by $a_n = 5n - 7$ is:
(a) -7
(b) 7
(c) 5
(d) -2
- The value of p for which $(2p + 1)$, 10 and $(5p + 5)$ are three consecutive terms of an AP is:
(a) -1
(b) -2
(c) 1
(d) 2
- n^{th} term of the AP: $-2, -7, -12, \dots$ is given by:
(a) $-(3n - 5)$
(b) $-(3n - 3)$
(c) $-(5n - 5)$
(d) $-(5n - 3)$
- The next (4^{th}) term of the AP $\sqrt{7}, \sqrt{28}, \sqrt{63}, \dots$ is:
(a) $\sqrt{70}$
(b) $\sqrt{84}$
(c) $\sqrt{97}$
(d) $\sqrt{112}$
- The number of terms in AP $5, 9, 13, \dots, 185$ is:
(a) 31
(b) 51
(c) 46
(d) 40
- If 1^{st} term of an AP is equal to its common difference and the 2^{nd} term is 10, then the 10^{th} term of the AP is:
(a) 30
(b) 40
(c) 50
(d) 60

Assertion-Reason Based Questions

The following questions are Assertion and Reason based questions. Two statements are given, one labelled as Assertion (A) and the other is labelled as Reason (R). Select the correct answer to these questions from the codes (a), (b), (c) and (d) as given below.

- (a) Both (b), (c) and (d) as given below.
- (b) Both A and R are true but R is not the correct explanation of A.



- (c) A is true, but R is false.
- (d) A is false, but R is true.
8. Assertion (A) : Common difference of the AP: $-5, -1, 3, 7, \dots$ is 4.
Reason (R) : Common difference of the AP: $a, a + d, a + 2d, \dots$ is given by $d = 2^{\text{nd}}$ term $- 1^{\text{st}}$ term.
9. Assertion (A) : The formula of oreneral $a = 10, d = 5, a_n = 95$ is 16 .
Reason(R) : term of an AP is $a_n = a + (n - 1)d$.

Very Short Answer Questions

10. Find the common different AP: 5, 9, 13, 17....
11. Find the common difference of the Arithimetic Progression (AP) $\frac{1}{a}, \frac{3-a}{3a}, \frac{3-2a}{3a}, \dots (a \neq 0)$.
12. Determine the AP whose third term is 5 and seventh term is 9.
13. If the term of an AP exceeds its 10^{th} term by 7, find the common difference

Short Answer Questions

14. How many terms are there in an AP whose first and fifth terms are -14 and 2, respectively and the last term is 62.
15. How many two digit natural numbers are divisible by 7?
16. Determine the AP whose fifth term is 19 and the difference of the eighth term from the thirteenth term is 20.
17. $26^{\text{th}}, 11^{\text{th}}$ and the last term of an AP are 0, 3 and $-\frac{1}{5}$ respectively. Find the common difference and the number of terms of the AP.
18. The 24^{th} term of an AP is twice its 10^{th} term. Show that its 72^{nd} term is 4 times its 15^{th} term.
19. For an AP, it is given that the first term (a) = 5, common difference (d) = 3, and the n^{th} term (a_n) = 50. Find n and sum of first n terms (S_n) of the AP.
20. Find the sum of all natural numbers between 100 and 500 which are exactly divisible by 8 .

Long Answer Questions

21. The first term of an AP is 3 , the last term is 83 and the sum of all its terms is 903 . Find the number of terms and the common difference of the AP.
22. A lab technician has a starting salary of ₹ 22,000 per year and receives a raise of ₹ 500 each year.
- (i) What will her salary be in the seventh year?
- (ii) What is the total salary earned by the lab technician over 7 years?



CASE STUDY BASED QUESTIONS

23. In a board game, the number of seashells in different cells forms an AP. The total number of seashells in the 3rd and 11th cells is 68, and the 11th cell contains 24 more seashells than the 3rd cell.

Based on the above information, answer the following questions:

- (i) What is the difference between the number of seashells in the 19th and 20th cells?
- (ii) How many seashells are there in the first cell?
- (iii) (a) How many total seashells are there in first 13 cells?

OR

- (b) What is the sum of number of seashells in the 7th and 9th cell?

ANSWER KEY

- 1. (c) 2.(c) 3.(d) 4.(d) 5.(d) 6.(c)
- 7. (c) 8.(a) 9.(d)
- 10. $a_1 = 5, a_n = a_{n-1} + 4$ for $n \geq 2$
- 11. $-\frac{1}{3}$
- 12. 3, 4, 5, ...
- 13. 1
- 14. 20
- 15. 13
- 16. 3, 7, 11, 15, ...
- 17. $d = -\frac{1}{5}, n = 27$
- 19. $n = 16, S_n = 440$
- 20. 15000
- 21. $n = 21, d = 4$
- 22. (i) ₹ 25,000
(ii) ₹ 1,64,500
- 23. (i) 3
(ii) 16
(iii) (a) 442
OR (b) 74



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