Mathematics

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(Chapter – 8) (Predicting What Comes Next: Exploring Sequences and Progressions)
(Assignment 2)
(Class – 9)

Name _____ Date _____

Answer all 15 questions. Choose one option for each MCQ. Show your working and give reasons where required.

Section A: Multiple Choice Questions

1. How many three-digit numbers are divisible by 7?

(**Hint:** All three-digit numbers divisible by 7 form an AP. Find the smallest and largest such three-digit numbers.)

(a) 127 (b) 128
(c) 129 (d) 142

2. Is 1, 3, 9, 27, 81, … a geometric progression? If so, what is the common ratio?

(a) Yes; r = 2. (b) Yes; r = 3.
(c) Yes; r = 9. (d) No.

3. Find the first five terms of the sequence in which the n^{th} term is given by (ii) $t_n = 2 - 5n$ for $n \geq 1$.

(a) −3, −8, −13, −18, −23 (b) 3, 8, 13, 18, 23
(c) −5, −10, −15, −20, −25 (d) −2, −7, −12, −17, −22

4. Consider the expression $t_n = 3n - 7$.

(ii) Which term of the sequence is 332?

(a) 111th term (b) 112th term
(c) 113th term (d) 114th term

5. For $n \geq 1$, the sequence is defined by $t_n = 2^n$. Which statement is correct?

(a) It is an AP with d = 2. (b) It is a GP with r = 2.
(c) It is a GP with r = 1/2. (d) It is neither an AP nor a GP.

Section B: Very Short Answer Questions

6. Why is it useful to have an explicit formula for the n^{th} term of a sequence?

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7. As another example, consider the sequence that is generated by the explicit formula $s_n = 5n - 2$. Can you write the first 6 terms of this sequence? What is the 100^{th} term? The 1000^{th} term?

Answer:

8. Find the n^{th} term of the AP: 11, 8, 5, 2 ... Write the recursive rule for this AP.

Answer:

9. Check whether the following sequences are geometric progressions and find their n^{th} terms.
(i) 2, 10, 50, 250, ...

Answer:

10. Can you use this formula to find S_{20}, S_{50} or S_{1000}?
Here $S_n = n(n + 1)/2$ is the sum of the first n natural numbers.

Answer:

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Section C: Short and Long Answer Questions

11. Let $T_1 = 1$, $T_2 = 2$, $T_3 = 4$, and $T_n = T_{n-1} + T_{n-2} + T_{n-3}$ for $n \geq 4$. Find T_4, T_5, T_6, T_7, and T_8.

Answer:

12. Which term of the AP : 21, 18, 15, ... is – 81? Also, is 0 a term of this AP? Give reasons for your answer.

Answer:

13. Sequence A is an AP with first term 3 and common difference 4. Sequence B is a GP with first term 3 and common ratio 2. Write the first five terms of both sequences. At which position does B first exceed A?

Answer:

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14. Determine the AP whose third term is 16 and whose 7^{th} term exceeds the 5^{th} term by 12.

Answer:

15. Find a GP for which the sum of the first two terms is – 4 and the fifth term is 4 times the third term.

Answer: