

ARITHMETIC SEQUENCES AND ALGEBRA

Std X Chapter - 3

1. Find the algebraic form of the arithmetic sequences given below.

- 1) 9, 13, 17, 21
- 2) 11, 21, 31, 41
- 3) 1, 7, 13, 19
- 4) 2, 7, 12, 17.....
- 5) $1/4, 3/4, 5/4$
- 6) $1/6, 3/6, 5/6$

2. The terms of some arithmetic sequences in two specified positions are given below. Find the algebraic form of each.

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|-----------------------------|----------------------------|
| 1) 1 st term 6 | 2) 2 nd term 8 |
| 10 th term 42 | 6 th term 36 |
| 3) 3 rd term 10 | 4) 2 nd term 24 |
| 7 th term 2 | 5 th term 6 |
| 5) 10 th term 55 | 6) 2 nd term 5 |
| 16 th term 91 | 9 th term 26 |

3. Algebraic form of some arithmetic sequences are given below. Find the first term and the common difference. Write arithmetic sequences.

Algebraic form	First term	Common difference	Arithmetic sequence
1. $3n + 2$			
2. $7n + 2$			
3. $5n + 3$			
4. $4n - 1$			
5. $6n - 1$			

4. Prove that the arithmetic sequence with first term $1/4$ and common difference $1/8$ contains all natural numbers.

5. Prove that the arithmetic sequence with first term $1/2$ and common difference $1/4$ contains all natural numbers

6. Prove that the arithmetic sequence with first term $3/4$ and common difference $1/2$ contains no natural numbers.

7. Prove that the arithmetic sequence with first term $1/5$ and common difference $2/5$ contains all odd numbers but no even numbers.

8. Prove that in the arithmetic sequence 3, 5, 7.....the squares of all terms are also terms of the sequence.

9.	Prove that the arithmetic sequence 6, 10, 14..... does not contain any perfect squares.
10.	Prove that the arithmetic sequence 7, 11, 15..... does not contain any perfect squares.
11.	<p>Calculate the sum of the arithmetic sequences given below.</p> <p>1) $1 + 2 + 3 + \dots + 50$</p> <p>2) $7 + 14 + 21 + \dots + 350$</p> <p>3) $3 + 6 + 9 + \dots + 150$</p> <p>4) $1 + 6 + 11 + \dots + 96$</p> <p>5) $10 + 14 + 18 + \dots + 86$</p> <p>6) $\frac{1}{6} + \frac{3}{6} + \frac{5}{6} + \dots + \frac{39}{6}$</p> <p>7) $1 + 1\frac{1}{2} + 2 + \dots + 20\frac{1}{2}$</p>
12.	<p>Calculate the sum of the first 30 terms of each of the arithmetic sequences below.</p> <p>1) 7, 11, 15..... 2) 10, 13, 16.....</p> <p>3) 8, 13, 18..... 4) 11, 15, 19.....</p>
13.	Find the sum of all three digit numbers that are multiples of 5.
14.	Find the sum of all three digit numbers that leave a remainder of 1 when divided by 3
15.	Find the sum of all two digit numbers that leave a remainder of 2 when divided by 4
16.	<p>The n^{th} term of some arithmetic sequences are given below. Find the sum of first n terms.</p> <p>1) $6n + 2$ 2) $4n - 1$ 3) $8n + 1$ 4) $6n - 2$</p>
17.	<p>The sum of the first n terms of some arithmetic sequences are given below. Find the n^{th} term of each.</p> <p>1) $n^2 + 3n$ 2) $2n^2 + 4n$ 3) $n^2 - 3n$ 4) $3n^2 - 2n$</p> <p>5) $2n^2 + 3n$ 6) $3n^2 + n$</p>
18.	<p>a) Calculate the sum of the first 30 natural numbers</p> <p>b) Calculate the sum of the first 30 numbers got by multiplying the natural numbers by 4 and adding 1. Calculate the sum of first n terms.</p>
19.	How much more is the sum of the first 30 terms of the arithmetic sequence 13, 18, 23.....than the sum of the first 30 terms of the arithmetic sequence 6, 11, 16.....
20.	The 14 th term of an arithmetic sequence is 99 and the 27 th term is 190. Calculate the sum of first 40 terms of this sequence.
21.	The 12 th term of an arithmetic sequence is 49 and the 9 th term is 37. Find the sum of first 20 terms of this sequence.
22.	<p>The 6th term of an arithmetic sequence is 40 and the 10th term is 60.</p> <p>a) What is the 2nd term of the sequence.</p> <p>b) What is the 4th term of the sequence.</p> <p>c) Find the sum of the first 5 terms of this sequence</p> <p>d) Find the sum of the first 15 terms of this sequence</p>