Notes of Online class

Session 4

We have discussed the concept of arithmetic sequence. The squence with a com mon difference is called arithmetic sequence.Knowing the first term and common difference we can write arithmetic sequence.

■ Today we discuss a property of arithmetic sequence. When we add common dif ference to the first term we get second term.Adding two common differences to the first term we get third term.Adding three times common difference to the first term we get fourth term.

■ Adding 3 common differences to the second term we get fifth term. Adding 5 common differences to the fifth term we get tenth term

■On subtracting 4 common differences from tenth term we get sixth term.

■The difference between tenth term and sixteenth term of an arithmetic sequence will be 6 times its common difference.

■The difference between any two terms of an arithmetic sequence will be a multiple of its common difference.

Examples

1) Common difference of an arithmetic sequence is 4.

   a) What is the difference between fifth term and tenth term?

   b) What is the difference between 10 term and 20 th term

   c) Can the difference between any two terms 25? How can we realise it

Answer

a) $x_{10} - x_5 = 5d = 5 \times 4 = 20$

b) $x_{20} - x_{10} = 10d = 40$

c) The difference between any two terms of an arithmetic sequence is a multiple of common difference . 25 is not a multiple of 4.So 25 cannot be the difference .

2) Consider the arithmetic sequence with first term 7 and common difference 4 2

a) Write the sequence.

b) What is the difference between tenth term and fifteenth term ?

c) What number should be added to the 24 th term to get 30 th term?

d) What number should be subtracted fron 24 th term to get 20 th term ?

Answer

a) $7, 11, 15 \cdots$

b) $x_{15} - x_{10} = 5d = 5 \times 4 = 20$

c) $6d = 6 \times 4 = 24$

d) $4d = 16$

3) 12 th term of an arithmetic sequence is 28 and 16 th term is 36

a) What is the common difference ?

b) What is the first term ?

c) What is the tenth term ?

d) Can 49 a term of this sequence ?

Answer

a) $4d = 36 - 28 = 8, d = 2$

b) $x_1 = x_{12} - 11d = 28 - 11 \times 2 = 28 - 22 = 6$

c) $x_{10} = x_{12} - 2d = 28 - 4 = 24$

d) The difference between 49 and another term 28 is 21. It is not a multiple of 2. So we can say 49 is not a term

4) First term of an arithmetic sequence is 7 and its tenth term is 34

a) What is the common difference ?

b) Write the sequence ?

c) What is the 32 nd term of this sequence ?

Answer

a) $9d = 34 - 7 = 27, d = 3$

b) $7, 10, 13, 16, 19 \cdots$

c) $x_{32} = x_{10} + 22d = 34 + 22 \times 3 = 34 + 66 = 100$

5) $\square, \square, \square, 32, \square, \square, 47$ are in an arithmetic sequence . 3

a) What is the common difference ?

b) Write the missing terms

c) Write the relation between the middle term and terms at the ends

d) Can you find the same relation in other pair of terms ?

Answer

a) $47 - 32 = 3d$
$3d = 15, d = 5$

b) $17, 22, 27, 32, 37, 42, 47$

c) The sum of the terms at the ends is two times the term in the middle.

d) Sum of the terms equidiatant from both ends is two times the term at the middle.

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