MATHEMATICS WORKSHEET

ARITHMETIC- PROGRESSIONS

CLASS: 10

Level 1

1. *Show that the following sequences are in AP:*

i) $\frac{1}{y}, \frac{2}{y}, \frac{3}{y} \dots \dots \dots$

ii) $\sqrt{2}, 3\sqrt{2}, 5\sqrt{2} \dots \dots \dots \dots$

iii) $3 - \sqrt{5}, 2 - \sqrt{5}, 1 - \sqrt{5} \dots \dots \dots$

iv) $1 - x^2, 1, 1 + x^2 \dots \dots \dots$

2. *Write the first four terms of an A.P , when the first term 'a' and the common difference 'd' are given as follows:*

   i) *a= 10 , d=7*

   ii) *a = -1 , d = 1/3*

3. i) *The first term of an A.P is -2 and the 10th term is 16. Determine the 15th term of the A.P.*

   ii) *The third term of an A.P is 1 and the 6th term is -11. Determine its 15th term and the rth terms.*

4. i) *Find the number of terms in the A.P: $17 , 14\frac{1}{2} , 12 \dots \dots \dots . -38$.*

   ii) *Which term of the A.P: 5, 2, -1… Is -22?*

5. *Find the sum of indicated number of terms of the following A.P.s:*

   i) *0, -7, -14…….. to 45 terms.*

   ii) *0.9, 0.91, 0.92…….. to 100 terms.*

Level -2

1. *The third term of an A.P is 'p' and the 4th term is 'q'. Find its 10th term.*

2. *If in an A.P the 24th term is twice the 10th term, prove that 36th term is twice the 16th term.*

3. If 5 times the 5th term of an A.P is equal to 10 times the 10th term, show that its 15th term is zero.

4. If 2nd, 31st and last terms of an A.P are $\frac{31}{4}$, $\frac{1}{2}$, and $\frac{-13}{2}$ respectively. Find the first term and the number of terms.

5. Find, whether 50 is a term of the sequence 4, 7, 10, 13…. or not. If yes, which term is it?

6. Find the 15t term from the end of:

   i) 5, 7, 9, …………99   ii) -10, -20, -30 …………-1000

7. Is 301 a term of the sequence 5, 11, 17, 23 …. ?

8. Find the sum of indicated number of terms of the following A.Ps:

   i) $1 - \frac{1}{n}$, $1 - \frac{2}{n}$, $1 - \frac{3}{n}$ … … …. to n terms.

   ii) $(a - b)^2$, $a^2 + b^2$, $(a + b)^2$ ………… n terms.

9. Find the sum of 30 consecutive odd numbers of which the last is 127.

10. A man gets employment of Rs.650 per month with annual increment of Rs.50.What does he earn in 15 years?

Level-3

1. The pth term of an A.P is q and q^{th} term is p. Find $(p + q)^{th}$ term.

2. Find the middle term of the A.P: 1, 8, 15, 22 ……505.

3. If $(r + 1)^{th}$ term of an A.P is twice the $(p + 1)^{th}$ term, then prove that $(5r + 1)^{th}$ term is twice $(2r + p + 1)^{th}$ term.

4. The sum of certain number of terms of an A.P is 57 and the first and the last terms are 17 and 2 respectively. Find the number of terms and the common difference.

5. The sum of n terms of an A.P whose first term is 5 and the common difference is 36 is equal to the sum of two n terms of another A.P whose first term is 36 and the common difference is 5. Find n.

6. A student taking a test consisting of 10 questions is told that each question after the 1st is worth 2 marks more than the preceding question. If the third question is 5 marks, what is the maximum number of marks?

7. *A tree in each year grows 4cm less than it did in the previous year .If it grew 1m in the 1st year, in how many years will it have ceased growing and what will be its height then?*

8. *Find the sum of the first29 terms of an A.P whose n^{th} term is given by $t_n = 2 - 3n$.*

9. *The nth term of an A.P is given by $t_n = 5n - 3$. Find the sum of the first 20 terms of an A.P.*

10. *The first term of an A.P is 5, the last term is 45 and the sum is 400.Find the number of terms and the common difference.*

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LEVEL BOOSTER

1) I can identify arithmetic progression from a series of numbers

2) I can identify first term(a) and common difference(d) in an arithmetic progression

3) I can find n^{th} term and specific terms of an A P using, a_n = a+ (n-1) d

4) I can find the sum of n terms and specific terms of an A P using, S_n=n/2[2a+ (n-1) d]

5) 1 can apply a_n and S_n formula for word problems