Cosmo School

Work Sheet – 04 (Mathematics) for class – Nine (27.09.2020)

Chapter– Thirteen, Exercise- 13.2

Finite Series

Creative Questions:

1. **(i) 2 + 7 + 12 + 17 +……is an arithmetic series. (ii) 7 + x + y + z + 4375 +…….is a geometric series.** **[D.B.- 20]**
   a) Solve: $\frac{y}{m}+\frac{m}{y}=\frac{y}{n}+\frac{n}{y}$.
   b) If the sum of first n terms of the series (i) is 2235 then find the value of n.
   c) Find the value of x, y, z from the series (ii).

2. **7 + 12 + 17 +……is an arithmetic series and 5th and 8th term of geometric series are $3\sqrt{3}$ and -27 respectively.** **[R.B.- 20]**
   a) Solve the system of equations: 4x + 3y = 6 and x – 2y = 7.
   b) If sum of first n terms of the arithmetic series 1197 then find the value of n.
   c) Find the geometric series.

3. **The third term of a geometric series is $\frac{1}{\sqrt{3}}$ and 8th term is $\frac{1}{27}$, another arithmetic series the sum of first 10 terms is 155 and the sum of first 20 terms is 610.** **[Dj.B.- 20]**
   a) Which term of the series: 5 + 8 + 11 +……is 383?
   b) Find the geometric series.
   c) Find the 30th term of the arithmetic series.

4. **The 3rd and 7th term of a geometric series are $\frac{1}{2\sqrt{2}}$ and $\frac{1}{8\sqrt{2}}$ and the sum of the first 10 terms and firs 20 terms are 155 and 610 of another arithmetic series.** **[S.B.- 20]**
   a) Which term is $\frac{1}{625\sqrt{5}}$ of the series $1+\frac{1}{\sqrt{5}}+\frac{1}{5}+$……?
   b) Determine of the sum of first eight terms of the geometric series.
   c) Determine the sum of first 25 terms of the arithmetic series.

5. **(i) $6 + m + n + p + \frac{3}{8}$ is a geometric series.**
   (ii) The sum of the first p terms of an arithmetic series is q and the first q terms are p. **[J.B.- 20]**
   a) If 2, x and 32 are ordered proportional then find the value of x, where x > 0.
   b) Find the value of m, n and p from (i).
   c) Form (ii) then find the sum of first (P + q) terms.

6. **(i) The 6th term of a geometric series is $-\frac{\sqrt{3}}{9}$ and 10th term is $-\frac{1}{27\sqrt{3}}$.**
   (ii) The sum of first 10 terms of an arithmetic series is 150 and first 20 terms are 500. **[B.B.- 20]**
   a) Which term is 399 of the series: 3 + 7 + 11 +……?
   b) Find the geometric series.
   c) Find the 35th term of the arithmetic series.

7. **The sum of first n terms of the series: 2 + 4 + 8 + 16 +..... is 1022 of an arithmetic series is 34 and 16th term of that.** **[D.B.- 19]**
   a) Find the sum of the series: $1^2+2^2+3^2+4^2+$……$+11^2$.
   b) Find the value n.
   c) Find the sum of first 20 terms of the arithmetic series.

8. **If the first term of a geometric series is $\frac{1}{2}$ and 7th term is $\frac{1}{128}$. If the sum of first 5 terms of an arithmetic series is 35 and first 10 terms is 120.** **[R.B.- 19]**
   a) Find the common difference of the series: $\log 3+\log 9+\log 27+\log 81+$ ……
   b) Determine the sum of first seven terms of the geometric series.
   c) Find the 20th term of the arithmetic series.

Mithun Kumar

9. 15^{th} term of an arithmetic series is 89 and 21^{st} term of that series is 125. Another geometric series: $-\frac{1}{2} + x + y + z - 2 + \ldots\ldots\ldots\ldots$ [Dj.B.- 19]

a) Find the 210^{th} term of the series: 7 + 11 + 15 + ...

b) If the first term of the arithmetic series given in the stem is 25 then find the sum of first 25 terms.

c) Find the value of x, y and z of geometric series given in the stem.

10. The 4^{th} term of a geometric series is $\frac{\sqrt{2}}{3}$ and 7^{th} term is $\frac{4}{9\sqrt{3}}$. [C.B.- 19]

a) Which term is $\frac{1}{125}$ of the series: $125 + 25 + 5 + \ldots\ldots\ldots$ determine?

b) Determine the series.

c) Show that, the sum of first 6 terms of the series is $\frac{19}{18}(\sqrt{3} + \sqrt{2})$.

11. The 4^{th} and the 10^{th} terms of a geometric series are $\frac{1}{3}$ and $\frac{1}{81}$ and the sum of the first 12 terms and first 24^{th} terms are 222 and 876 of another arithmetic series. [Ctg.B.- 19]

a) Which term is 303 of the series: 3 + 5 + 7 + 9 +.....?

b) Find the geometric series.

c) Calculate the 60^{th} terms of arithmetic series.

12. 1^{st} series: $\frac{1}{2} + \frac{1}{\sqrt{2}} + 1 + \ldots\ldots\ldots$
2^{nd} series: 4 + 7 + 10 +..... [S.B.- 19]

a) Find the solution set of the equation x (x - a) = (x - a).

b) Find the sum of the first ten terms of the 1^{st} series.

c) If the sum of the first n terms of 2^{nd} series is 714 then find the value of n.

13. (i) 7 + p + q + s + 16807 +…… is geometric series.
(ii) 7 + 12 + 17 + 22 +…… [B.B.- 19]

a) Find the sum of first 50 natural numbers.

b) Find the value of p, q and s of the series (i).

c) If the sum of first n terms of the series (ii) is 1090 then find the value of n.

14. The 3^{rd} and the 8^{th} terms of a geometric series are $\frac{1}{\sqrt{3}}$ and $\frac{1}{27}$ and the sum of first 10 terms and first 20 terms are 155 and 610 of another arithmetic series. [R.B.- 17]

a) Of the series: 5 + 8 + 11 + 14 + ... which term is 383?

b) Find the geometric series.

c) Calculate the 30^{th} terms of arithmetic series.

15. $3 + a + 9 + \ldots\ldots\ldots\ldots + 60$ is an arithmetic series. [C.B.- 17]

a) Determine the value of a.

b) Find the sum of the series.

c) Considering the first term of the obtained series as 1^{st} term and the common difference as common ratio construct a geometric series and find the sum of first 9 terms of the series by applying the formula.

16. 7 + x + y + 189 is a geometric series. [Ctg.B.- 17]

a) Express the 4^{th} term in terms of an algebraic equation when a is the first term and r is the common ratio.

b) Find the value of x and y.

c) Considering the 1^{st} term as first term and common ratio as common difference of the given series form an arithmetic series and find the sum of its 1^{st} 16 terms.

17. The n^{th} term of a series is 2n - 1 and $n \in \mathbb{N}$. [B.B.- 17]

a) Find out the series.

b) Which of the terms of the series is 169?

c) Considering the first term and the common difference of the series as the first term and the common ratio of a geometric series respectively

Mithun Kumar

then find the sum of the first 10 terms of the new series after constructing it.

18. The sum of first n terms of the series $25 + 23 + 21 + \ldots\ldots\ldots$ is -456. [D.B.- 16]

a) Find the 7^{th} term of the series.
b) Find the value of n.
c) Considering the first term and common difference of the given series as the first term and common ratio of geometric series respectively then find the sum of first 7 terms of it.

19. The first term of an arithmetic series is 5 and common difference is 6. [B.B.- 16]

a) Find the series.
b) The total sum of first n terms of the series is 705. Find the value of n.
c) Considering the common difference and the first term of the given series as the first term and the common ratio of a geometric series then find the sum of first 7 terms of it.

20. $33 + 29 + 25 + \ldots\ldots\ldots -19$ is a series and $m = \frac{\sqrt{1+y}+\sqrt{1-y}}{\sqrt{1+y}-\sqrt{1-y}}$. [J.B.- 16]

a) What is the 12^{th} term of the series?
b) Prove that, $m^2 - \frac{2m}{y} + 1 = 0$.
c) Considering the first term of the given series as first term and common difference as common ratio construct a new series and find the sum of the first five terms of that series.

21. $\frac{1}{\sqrt{2}} - 1 + \sqrt{2} - \ldots\ldots\ldots\ldots$ is a geometric series. [Ctg.B.- 16]

a) What is the common ratio and 4^{th} term of the series?
b) Which of the term of the series is $8\sqrt{2}$?
c) Find the 10^{th} term and the sum of the 1^{st} 10 terms of the series.

Mithun Kumar