

3/7/2020

FRIDAY

MATHEMATICS

STD-8

Notes

- 1) a) Write the first integer term of the arithmetic sequence $\frac{1}{7}, \frac{2}{7}, \frac{3}{7}, \dots$.
- b) What is the sum of the first 7 terms of this sequence?

Ans) a) $\frac{7}{7}$

$$\begin{aligned} \text{b) } \frac{1}{7} + \frac{2}{7} + \frac{3}{7} + \dots + \frac{7}{7} \\ &= \frac{1+2+3+\dots+7}{2} \\ &= \frac{7 \times 8}{2 \times 7} = \underline{\underline{4}} \end{aligned}$$

- 2) a) What is the remainder on dividing the terms of the arithmetic sequence 100, 107, 114, ... by 7?

- b) Write the sequence of all the three-digit numbers which leaves remainder 3 on division by 7? Which is the last term of this sequence?

Ans) a) 2

b) 101, 108, 115, ...

Last 3-digit term of this sequence = 997

3. Find the following sums :

a) $1 + 2 + 3 + \dots + 100$

b) $1 + 3 + 5 + \dots + 99$

c) $2 + 4 + 6 + \dots + 100$

d) $3 + 7 + 9 + \dots + 199$

Ans) a) $a_1 = 1$ $n = \frac{\text{last term} - a_1}{d} + 1$
 $d = 1$
 $= \frac{100 - 1}{1} + 1$

Sum = $\frac{n}{2} (a_1 + \text{last term})$
 $= \frac{100}{2} (1 + 100)$

$= 50 (101) = \underline{\underline{5050}}$

$= 50 (101)$

$= \underline{\underline{5050}}$

$$\begin{array}{r} 101 \\ 50 \\ \hline 000 \\ 505 \\ \hline 5050 \end{array}$$

$$\begin{aligned}
 \text{b) } x_1 &= 1 & n &= \frac{99-1}{2} + 1 \\
 d &= 2 & &= \frac{49}{1} + 1 \\
 & & &= \frac{98}{2} + 1 \\
 & & &= \underline{\underline{50}}
 \end{aligned}$$

$$\begin{aligned}
 \text{Sum} &= \frac{50}{2} [1 + 99] \\
 &= 25 [100] \\
 &= \underline{\underline{2500}}
 \end{aligned}$$

$$\begin{aligned}
 \text{c) } x_1 &= 2 & n &= \frac{100-2}{2} + 1 \\
 d &= 2 & &= \frac{98}{2} + 1 \\
 & & &= 49 + 1 \\
 & & &= \underline{\underline{50}}
 \end{aligned}$$

$$\begin{aligned}
 \text{Sum} &= \frac{50}{2} [2 + 100] = 49 + 1 \\
 &= 25 [102] \\
 &= \underline{\underline{2550}}
 \end{aligned}$$

$$\begin{array}{r}
 1 \\
 102 \\
 \underline{25} \\
 510 \\
 204 \\
 \hline
 2550
 \end{array}$$

$$\begin{aligned}
 \text{d) } x_1 &= 3 & n &= \frac{199-3}{4} + 1 \\
 d &= 4 & &= \frac{49}{1} + 1 \\
 & & &= \frac{98}{2} + 1 \\
 & & &= \underline{\underline{50}}
 \end{aligned}$$

$$\begin{aligned}
 \text{Sum} &= \frac{50}{2} [3 + 199] = \underline{\underline{50}} \\
 &= 25 (202) \\
 &= \underline{\underline{5050}}
 \end{aligned}$$

$$\begin{array}{r}
 1 \\
 202 \\
 \underline{25} \\
 1010 \\
 404 \\
 \hline
 5050
 \end{array}$$