6/7/2020
MONDAY

MATHEMATICS

STD - X
class - 08

NOTES

- Sums

1) The expressions for the sum to n terms of some arithmetic sequences are given below. Find the expression for the nth term of each:

i) n^2+2n ii) $2n^2+n$ iii) n^2-2n iv) $2n^2-n$

v) n^2-n

Ans) i) $n^2 + 2n$

Sum of the first one term = first term $= 1^2+2\times1$

$= 1+2$

$= \underline{3}$

Sum of the first 2 terms $= 2^2+2\times2$

$= 4+4$

$= \underline{8}$

$f = 3$

$d = 5-3 = 2$

$x_1 + x_2 = 8$

$3 + x_2 = 8,$

$\therefore x_2 = 8-3 = \underline{5}$

$x_1 = 3$

$d = 2$

$\therefore x_n = f + (n-1)d$

$= 3 + (n-1)2$

$= 3 + 2n - 2$

$= \underline{2n+1}$

ii) $2n^2+n$

$x_1 = 2\times 1^2+1$

$= 2\times 1+1$

$= \underline{\underline{3}}$

$S_2 = 2\times 2^2+2$

$= 2\times 4+2$

$= 8+2$

$= \underline{\underline{10}}$

$\therefore x_2 = S_2 - x_1$

$= 10-3$

$= \underline{\underline{7}}$

$\therefore d = x_2 - x_1$

$= 7-3$

$= \underline{\underline{4}}$

$\therefore x_n = 3+(n-1)4$

$= 3+4n-4$

$= \underline{\underline{4n-1}}$

iii) n^2-2n

$x_1 = 1^2-2\times 1$

$= 1-2$

$= \underline{\underline{-1}}$

$S_2 = 2^2-2\times 2$

$= 4-4$

$= \underline{\underline{0}}$

$x_2 = S_2 - x_1$

$= 0--1$

$= \underline{\underline{1}}$

$\therefore d = 1--1$

$= \underline{\underline{2}}$

$\therefore x_n = f+(n-1)d$

$= -1+(n-1)2$

$= -1+2n-2$

$\therefore x_n = \underline{\underline{2n-3}}$

iv) $2n^2 - n$

$x_1 = 2 \times 1^2 - 1$

$= 2 - 1$

$= 1$

$S_2 = 2 \times 2^2 - 2$

$= 2 \times 4 - 2$

$= 8 - 2$

$= 6$

$\therefore x_2 = S_2 - x_1$

$= 6 - 1$

$= 5$

$\therefore d = 5 - 1$

$= 4$

$\therefore x_n = f + (n-1)d$

$= 1 + (n-1)4$

$= 1 + 4n - 4$

$= 4n - 3$

v) $n^2 - n$

$x_1 = 1^2 - 1$

$= 0$

$S_2 = 2^2 - 2$

$= 4 - 2$

$= 2$

$\therefore x_2 = S_2 - x_1$

$= 2 - 0$

$= 2$

$\therefore d = 2 - 0$

$= 2$

$\therefore x_n = f + (n-1)d$

$= 0 + (n-1)2$

$= 2n - 2$