DISCRETE

EE23BTECH11006 - Ameen Aazam*

Question : Find the sum of the following APs:

(a) $2, 7, 12, \ldots$ to 10 terms.
(b) $-37, -33, -29, \ldots$ to 12 terms.
(c) $0.6, 1.7, 2.8, \ldots$ to 100 terms.
(d) $\frac{1}{15}, \frac{1}{12}, \frac{1}{10}, \ldots$ to 11 terms.

Solution: From (**??**), we get the sum to n terms,

Input Parameters	Values	Description
$x(0)$	$2, -37, 0.6, \frac{1}{15}$	First term of AP
d	$x(1) - x(0)$	Common difference of AP
$x(n)$	$[x(0) + nd]u(n)$	General term of AP
$y(n-1)$		Sum to n terms of AP

TABLE 4
PARAMETERS

$$y(n) = \frac{(n+1)}{2}\{2x(0) + nd\}\,u(n) \tag{1}$$

Now taking the Z-transform we have,

$$Y(z) = \frac{x(0)}{(1-z^{-1})^2} + \frac{dz^{-1}}{(1-z^{-1})^3} \tag{2}$$

(a)

$$x(0) = 2 \tag{3}$$
$$d = 5 \tag{4}$$
$$\implies s(9) = 245 \tag{5}$$

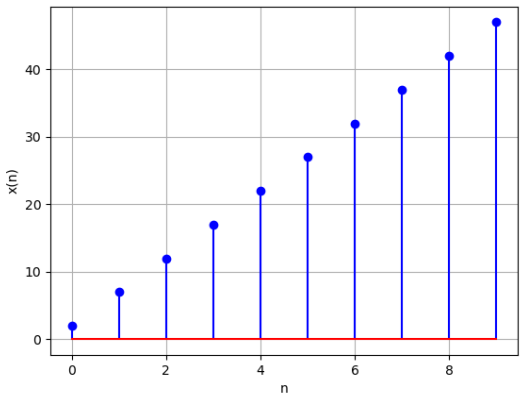

Fig. (a). 1*st* AP

(b)

$$x(0) = -37 \tag{6}$$
$$d = 4 \tag{7}$$
$$\implies s(11) = -180 \tag{8}$$

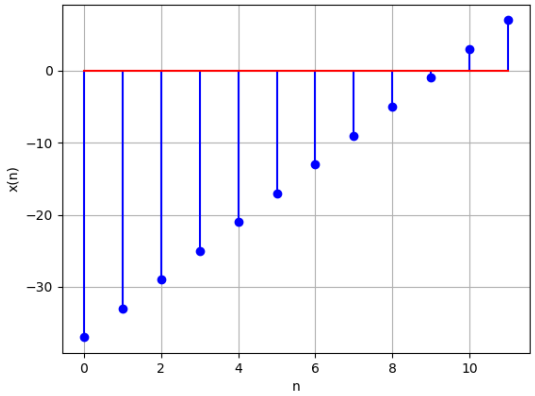

Fig. (b). 2*nd* AP

(c)

$$x(0) = 0.6 \tag{9}$$
$$d = 1.1 \tag{10}$$
$$\implies s(99) = 5505 \tag{11}$$

(d)

$$x(0) = \frac{1}{15} \tag{12}$$
$$d = \frac{1}{60} \tag{13}$$
$$\implies s(10) = 1.65 \tag{14}$$

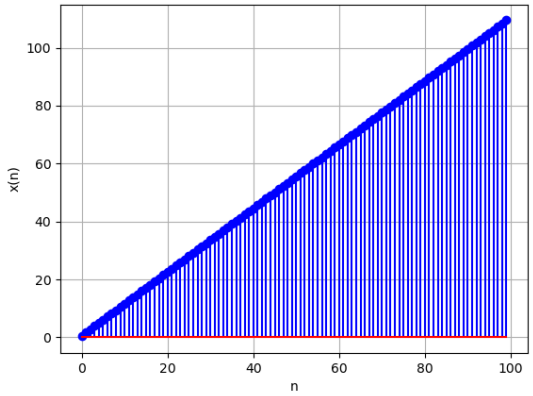

Fig. (c). 3*rd* AP

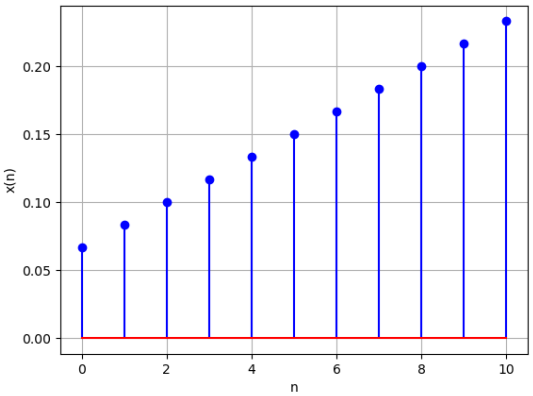

Fig. (d). 4*th* AP