Assignment

EE23BTECH11008 - Meenakshi

Q:The difference between any two cosecutive interior angles of a polygon is 5°.If the smallest angle is 120°,find the number of sides of polygon.
Solution: The interior angles of a polygon are in AP with $x(0) = 120$, $d = 5$ The sum of n terms of

Variable	Description	Value
$x(0)$	first term of AP	120
d	common difference of AP	5
$x(n)$	general term of AP	none

an AP is given by

$$S = \frac{n}{2}\left(2 \cdot x(0) + (n-1)d\right) \tag{1}$$

Sum of interior angles of AP is given by

$$S = (n-2)180 \tag{2}$$

$$\frac{n}{2}(2 \cdot x(0) + (n-1)d) = (n-2)180 \tag{3}$$

$$\frac{n}{2}(240 + (n-1)5) = (n-2)180 \tag{4}$$

$$n(235 + 5n) = 360n - 720 \tag{5}$$

$$5n^2 + 235n = 360n - 720 \tag{6}$$

$$5n^2 - 125 + 720 = 0 \tag{7}$$

$$n^2 - 25n + 144 = 0 \tag{8}$$

solving the above equation we get

$$n = 16, 9 \tag{9}$$

$$\boxed{x(n) = (120 - 5n) \times u(n)} \tag{10}$$

Now,

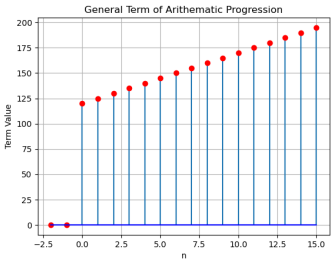

Fig. 0: Plot of the general term taken from Python

$$X(z) = x(0)U(z) + d\left(-z\frac{d(U(z))}{dz}\right) \tag{11}$$

ROC: $|z| > 1$ (12)

$$\boxed{X(z) = 120U(z) - 5z\frac{d(U(z))}{dz}} \tag{13}$$