

Assignment-1

EE:1205 Signals and Systems
Indian Institute of Technology, Hyderabad

Md Ayaan Ashraf
EE23BTECH11041

Question:

Two APs have the same common difference. The difference between their hundredth terms is 100. What is the difference between their thousandth terms?

Solution:

Parameter	Value
Difference between 100 th terms	100

TABLE 0
PARAMETER TABLE

let $x_1(n)$ and $x_2(n)$ be the 2 APs and d be the common difference for both APs

$$as : x(n) = x(0) + nd \quad (1)$$

$$x_1(100) = x_1(0) + 100d \quad (2)$$

$$x_2(100) = x_2(0) + 100d \quad (3)$$

$$x_1(100) - x_2(100) = (x_1(0) + 100d) - (x_2(0) + 100d) = x_1(0) - x_2(0) \quad (4)$$

$$x_1(0) - x_2(0) = 100(given) \quad (5)$$

Now:

$$x_1(1000) - x_2(1000) = (x_1(0) + 1000d) - (x_2(0) + 1000d) = x_1(0) - x_2(0) = 100$$

Therefore difference between 1000th terms=100