

Assignment-2

EE:1205 Signals and systems
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I. QUESTION 1.2.4

How many terms of the AP : 9, 17, 25, . . . must be taken to give a sum of 636?

II. SOLUTION

Here, we will start the numbering by taking the first digit as $n=0$

$$a_1 = 9 \quad (1)$$

$$a_2 = a_1 + 17 \quad (2)$$

$$9 + d = 17 \quad (3)$$

$$\therefore d = 8 \quad (4)$$

We know that, the sum of n terms of an A.P. is,

$$S_n = \frac{(n+1)}{2}[2a + nd] \quad (5)$$

According to the question,

$$\frac{(n+1)}{2}[2a + nd] = 636 \quad (6)$$

$$4n^2 + 13n + 9 = 636 \quad (7)$$

$$4n^2 + 13n - 627 = 0 \quad (8)$$

$$\therefore n = 11, -14.25 \quad (9)$$

We can ignore the negative value.

$$\therefore n = 11 \quad (10)$$

Hence, 12 terms of the A.P. is required to give a sum of 636.