Q:Two APs have the same common difference. The difference between their 100th terms is 100, what is the difference between their 1000th terms?

Solution:

$$x(n) = \{x(0) + nd\}u(n)$$
 (1)

$$x(99) - y(99) = 100 (2)$$

$$\implies (x(0) + 99d) - (y(0) + 99d) = 100 \tag{3}$$

$$\implies x(0) - y(0) = 100 \tag{4}$$

$$x(n) - y(n) = (x(0) + nd) - (y(0) + nd)$$
(5)

$$= x(0) - y(0) \tag{6}$$

$$= 100 \tag{7}$$

| Variable | Description | Value |
|-------------|---|---------------------|
| x(n) | n^{th} term of X | none |
| y(n) | <i>n</i> th term of Y | none |
| d | common difference between the terms of AP | none |
| x(n) - y(n) | difference of n^{th} terms of X and Y | x(99) - y(99) = 100 |

TABLE 0

INPUT PARAMETERS

Let

$$x(n) = \{101, 106, 111, \dots\}$$
 (8)

$$y(n) = \{1, 6, 11, ...\} \tag{9}$$

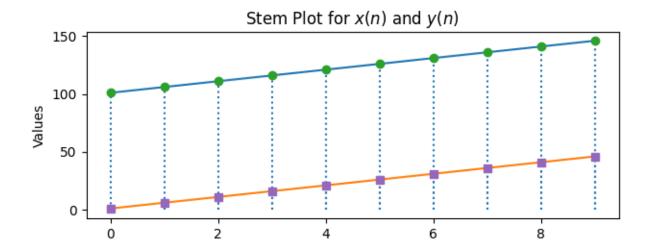


Fig. 0.