Exercise 11A

Question 1:
The given progression is 3, 9, 15, 21 .....
Clearly (9 - 3) = (15 - 9) = (21 - 15) = 6 which is constant
Thus, each term differs from its preceding term by 6
So, the given progression is an AP
Its first term = 3 and the common difference = 6

Question 2:
The given progression is 16, 11, 6, 1, -4 ....
Clearly (11 - 16) = (1 - 6) = (-4 - 1) = - 5 which is constant
Thus, each term differs from its preceding term by - 5
So the given progression is an AP
Its first term = 16 and the common difference = - 5

Question 3:
(i) The given AP is 1, 5, 9, 13, 17.....
Its first term = 1 and common difference = (5 - 1) = 4
$\therefore$ a = 1 and d = 4
The n^{th} term of the AP is given by
$T_n = a + (n-1)\, d$
$T_{20} = 1 + (20-1) \times 4 = 1 + 76 = 77$
Hence, the 20^{th} term is 77
(ii) The given AP is 6, 9, 12, 15 .....
Its first term = 6 and common difference = (9 - 6) = 3
$\therefore$ a = 6, d = 3
The n^{th} term of the AP is given by
$T_n = a + (n-1)\, d$
$T35 = 6 + (35-1) \times 3 = 6 + 102 = 108$
Hence, the 35^{th} term is 108
(iii) The given AP is 5, 11, 17, 23 .....
Its first term = 5, and common difference = (11 - 5) = 6
$\therefore$ a = 5, d = 6
The n^{th} term of AP is given by
$T_n = a + (n-1)\, d$
$T_n = 5 + (n-1) \times 6 = 5 + 6n - 6 = 6n - 1$
(iv) The given AP is (5a - x), 6a, (7a + x) .....
Its first term = (5a - x) and common difference = 6a - 5a - x = a + x
The n^{th} term of AP is given by
$T_n = a + (n-1)\, d$
$T_{11} = (5a - x) + (11-1)\,(a + x)$
$= 5a - x + 10x + 10x$
$= 15a + 9x = 3(5a + 3x)$
Hence the 11^{th} term is 3(5a + 3x)

Question 4:
(i) The given AP is 63, 58, 53, 48 ....
First term = 63, common difference = 58 - 63 = - 5
$\therefore$ a = 63, d = - 5
The n^{th} term of AP is given by
$T_n = a + (n-1)\, d$
$T_{10} = 63 + (10-1)\,(-5) = 63 - 45 = 18$

Hence the 10^{th} term is 18

(ii) The given AP is 9, 5, 1, -3....

First term = 9, common difference = 5 - 9 = -4

$\therefore a = 9, d = -4$

The n^{th} term of AP is given by

$T_n = a + (n-1)\, d$

$T_{14} = 9 + (14-1)\,(-4) = 9 - 52 = -43$

Hence, the 14^{th} term is - 43

(iii) The given AP is 16, 9, 2, -5

First term = 16, common difference = 9 - 16 = - 7

$\therefore a = 16, d = -7$

The n^{th} term of AP is given by

$T_n = a + (n-1)\, d$

$T_n = 16 + (n-1)\,(-7) \Rightarrow 16 - 7n + 7 = (23 - 7n)$

Hence, the n^{th} term is (23 - 7n).

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