Arithmetic Series - Q1 [Practice/E] (17/6/21)

For each of the following arithmetic sequences, find an expression for a_k:

(a) in the form $a_k = p + q(k - 1)$

(b) in the form $a_k = mk + c$

(c) in the form $a_k = a_{k-1} + t \; ; a_1 = u \;\; (k \geq 2)$

(where p, q, m, c, t & u are to be found)

(i) $4, 7, 10, 13, 16, \ldots$

(ii) $-2, -1, 0, 1, 2, \ldots$

(iii) $8, 6, 4, 2, 0, \ldots$

Solution

(i) (a) $a_k = 4 + 3(k-1)$

(b) $a_k = 3k + 1$

(c) $a_k = a_{k-1} + 3$; $a_1 = 4$ $(k \geq 2)$

(ii)(a) $a_k = -2 + (k-1)$

(b) $a_k = k - 3$

(c) $a_k = a_{k-1} + 1$; $a_1 = -2$ $(k \geq 2)$

(iii)(a) $a_k = 8 - 2(k-1)$

(b) $a_k = 10 - 2k$

(c) $a_k = a_{k-1} - 2$; $a_1 = 8$ $(k \geq 2)$