

Arithmetic Series - Exercises (1 page; 6/2/26)

(1) 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, ...

(ii) -2, -1, 0, 1, 2, ...

(iii) 8, 6, 4, 2, 0, ...

(2) If I pay £50 into a bank account, then £60 a year later, followed by £70 the following year, and so on, increasing by £10 each year, how long will it take for the amount in the bank account to reach £1000?

(3)(i) If teams A, B, C, D & E in some sporting competition have to play each other once, how many games are there in total?

(ii) Extend this to find a formula for $1 + 2 + 3 + \dots + n$

(4) For an arithmetic sequence with 1st term a and common difference d , show that the sum of the 1st n terms is

$$\frac{n}{2}[2a + (n - 1)d] \text{ by starting with } \sum_{k=1}^n [a + (k - 1)d]$$