Arithmetic Series Overview (17/6/21)

Q1 [Practice/E]

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

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

Q2 [Practice/E]

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?

Q3 [Problem/M]

(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 $1 + 2 + 3 + \cdots + n$

Q4 [Problem/E]

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

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