Arithmetic Sequences

1 The first term of an arithmetic progression is 14 and the 20th term is 25.4.

(i) Find the common difference. [2]

(ii) Find the sum of the first 500 terms. [2]

2 An arithmetic progression has first term a and common difference d. The sum of the first 50 terms is 5200. Another arithmetic progression also has first term a. This progression has common difference $3d$ and its 20th term is 234. Find the values of a and d. [6]

3 An arithmetic progression has first term 1.71 and common difference 0.02. A geometric progression has first term 250 and common ratio r. The sum to infinity of the geometric progression is equal to the sum of the first 80 terms of the arithmetic progression. Find the value of r. [6]

4 The first term of a sequence is 8 and the second term is 10.

(i) Given that the terms of the sequence form an arithmetic progression, find the sum of the first 100 terms. [3]

(ii) Given instead that the terms of the sequence form a geometric progression and that the sum of the first K terms is greater than 10^{15}, find the least possible value of K. [5]

5 An arithmetic progression has first term 8 and common difference 1.2. The sum of the first n terms of the arithmetic progression is denoted by S_n.

A geometric progression has first term 8 and common ratio 1.2. The sum of the first 35 terms of the geometric progression is denoted by G.

Given that $S_n > G$, find the least possible value of n. [8]